Appendix 2

Wetlands

Kodiak Airport EIS
Wetland Delineation Report

Prepared for

The Federal Aviation Administration

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A.1 Landscape Setting

Vigil-Agrimis, Inc. prepared this wetland delineation report for the Kodiak Airport EIS. The Kodiak Airport is about 5 miles south of the City of Kodiak on the northwest coast of Kodiak Island, Alaska. The proposed activities being reviewed in the EIS include improving runway-end and lateral-runway safety areas for Runway 18/36 and Runway 7/25.

The wetland delineation study area is generally located east of the Chiniak Highway. It is bordered on the south by the U.S. Coast Guard Base, on the east by St. Paul Harbor and on the north by the Buskin River. The study area includes a small part of the Buskin River State Recreation Area north of the River and a small area west of the Chiniak Highway off the end of Runway 7/25.

The area in the vicinity of the study area, as mapped by the U.S. Geological Survey (USGS), is illustrated in Figure 1. Color aerial photography (2004) in the immediate study area is illustrated in Figure 2. All figures are in Appendix A.

A.2 Previous Land Use

Kodiak, Alaska, was a center of the fur and whaling trade in the 1800s. The local economy transitioned to salmon by the turn of the century. The land in the vicinity of what is now the Airport began to be managed by the U.S. military prior to World War II. The development of naval facilities required extensive alteration to the natural terrain to level large coastal areas for the construction of a naval air station. The land in the study area was used as an airfield through the war by both the Navy and Coast Guard. Management of the complex was transferred exclusively to the Coast Guard in 1972.

A.3 Current Land Use

The majority of the study area is within Kodiak Airport which is the only airport on the island able to service commercial airlines and large aircraft. The land within the study area is primarily runway and taxiway but also includes unpaved grass infields and historic airport revetments. The Airport extends to the top of the south bank of the Buskin River. The study area also includes the banks and estuary of the river as well as portions of the Buskin River State Recreation Area north of the river. The Recreation Area is a popular fishing destination with picnicking and camping facilities and beach access.

B Study Area Alterations

The development of naval facilities required extensive terrain alteration to level large coastal areas for the construction of a naval air station. The major earthwork was conducted between the late 1930s through World War II. At that time the southern portion of the Buskin River floodplain and delta was leveled and/or filled. Devil's Creek was also diverted and placed in a culvert under the Airport. A number of small streams were redirected into ditches and culverts. There is evidence of change in the Buskin River vicinity in historical air photos following the 1964 tsunami. However, it is unclear if the visible changes were due to the tsunami, subsidence from the earthquake, or subsequent human activity.

C Precipitation Data and Analysis

The climate in this area is generally characterized as marine and mild with a relatively small daily and annual temperature range. Winter temperatures are between 20°F and 40°F while summers are between 40°F and 72°F. Rainfall occurs year round from just over 3-inches in drier months to just over 6-inches in wetter months. Mean annual precipitation is approximately 75 inches.

The nearest WETS Station is at Kitoi Bay (AK4812), located on the east side of Afognak Island about 30 miles due north of the study area (Appendix B). According to the Alaska Climate Research Center (ACRC) mean annual precipitation at Kitoi Bay is about 8-inches greater that at Kodiak Airport (ACRC, 2008). Based on Kitoi Bay station record (1961-1990) the growing season in the area runs from April to October.

The general weather pattern characterizing the growing season in Kodiak leading up to the wetland delineation field work would be described as wet and moderately warm. The delineation was conducted on September 11-13, 2007. Year-to-date precipitation up to the time of the delineation was approximately 59.51 inches. Average year-to-date precipitation is 47.69-inches; therefore the year's precipitation was 11.82 inches above or about 25% greater than average. This is above the normal precipitation range identified in the Kioti Bay WETS table but given the difference in annual precipitation amounts between Kioti bat and Kodiak Airport rainfall was considered analogous of a typical growing season.

Rain was substantial during the period immediately prior to and during the delineation (2.49 inches). Table 1 summarizes the precipitation at the time of the delineation. Precipitation for August-September averages 5.97 inches, roughly 1.00 inch above typical precipitation, which averages 4.93 inches during the April-September window of the growing season.

Table 1. Summary of Precipitation in September 2007 in Kodiak, Alaska

Category	September 5	September 13
24 Hour Precipitation	0.29 inches	0.42 inches
Monthly to Date	1.14 inches	3.63 inches
Normal Monthly to Date	0.86 inches	2.81 inches
Percent of Normal Recorded	132 percent of normal	129 percent of normal

*As determined AccuWeather, Inc. 2007 as published in the Kodiak Daily Mirror on the dates above.

D Methods

Wetlands areas were delineated using the "triple parameter" method described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) as modified by the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region* (Corps 2006). Wetlands are required to have a prevalence of wetland hydrology, hydric soils, and hydrophytic vegetation. Jurisdictional wetlands are determined when positive indicators of all of these three criteria are present. The wetland boundaries and classifications described herein represent best professional opinion based on the site conditions observed. Final boundaries may vary after review and acceptance by the U.S. Army Corps of Engineers (Corps).

The typical wetland delineation methodology was employed and no project specific adaptations were made. Specifics of the delineation included:

- Site visit date: September 11 through 13, 2007. Some vegetation was not identifiable because the delineation was late in the growing season.
- The February 2006 *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region* was used to identify potential wetlands. No deviations were made from the Manual.
- Fifteen sample plots were taken to describe seven wetlands. A majority of these were paired upland/wetland plots; however, data was collected only at wetland plots at three wetlands where subsurface was rock or was too hard to dig a pit in upland areas. Generally the paired plots were located very close to each other – not more than 10 feet apart.
- Off-site methods were not used in this delineation. However, 1-foot interval survey data and high resolution aerial photography were used to verify boundary and point locations collected using GPS.
- Farmed, pastured or other potential atypical areas were not encountered; requiring no special evaluation.
- Before field work started, the following references were used to help initially identify wetland features and suspect areas: the Soil Survey of the US Coast Guard Reservation, Kodiak Island, Alaska (1980) as described in Section D.1 and Figure 3; the Kodiak (C-2 and D-2) 15-minute National Wetlands Inventory (NWI) maps (1988) (Figure 4); and the *Revised Final Wetland Delineation Study of the Coast Guard Integrated Support Command Kodiak, Alaska* (Dames & Moore 1999) as described in Section F.

D.1 Soils

Soils at each representative wetland sample point were typically inspected to a depth of 16 inches to determine the presence or absence of hydric soils (wetland conditions). Plots were shallower in locations where bedrock and/or compacted gravel and cobble material prevented full excavation. At each sample location, the soil matrix color, soil texture, and presence of redoximorphic features or gleying were recorded. Soil hue, value, and chroma were determined using Munsell Soil Color Charts (Munsell Color Services 2000).

Soils in the study area are illustrated in Figure 3 and described in Table 2. As documented by historical references and verified by the soil surveys, the study area has been disturbed by human alterations. Three of the five soils found in the study area are Made Land. Made Land (25) is not on the hydric soil list. Made Land-Kodiak Complex (21) and Sharatin-Made Land Complex (22) have hydric inclusions of Kodiak and Sharatin soils which are hydric. Pasangshak very fine sandy loam (8) and Kodiak loamy fine sand (6) are hydric soils.

Table 2. Soils Mapped by SCS within the Study Area		
Soil Phase (Map Unit)	Hydric / Hydric Inclusions*	Location of Mapped Occurrence
Kodiak loamy fine sand (6)	Yes: 1 and 2B3 rating	Kodiak loamy fine sand (6) occurs east of the Chiniak Highway on the slopes of Barometer Mountain
Pasangshak very fine sandy loam (8)	Yes: 2B3 rating	Pasangshak very fine sandy loam (8) is present in the tidally influenced estuary area of the Buskin River.
Made Land-Kodiak Complex (21)	Kodiak Inclusions: 1 and 2B3 rating	Made Land-Kodiak complex (21) is present in moderately developed areas of the Coast Guard Reservation and Airport.
Sharatin-Made Land Complex (22)	Sharatin Inclusions: 2B3 rating	Sharatin-Made Land complex (22) is present in the developed areas of the Buskin River State Recreation Area.
Made Land (25)	No	Made Land (25) is present in highly developed areas of the Airport and Coast Guard Reserve such as runway and taxiways.

*As determined by the US Department of Agriculture, Soil Conservation Service (1980) and Natural Resources Conservation Service (NRCS) online lists of hydric soils (http://soils.usda.gov/use/hydric/)

Note: Hydric Soils list was not available for the US Coast Guard Reservation Soil Survey so the Northeast Kodiak Island Area Hydric Soil List was used. It includes the same soil names but uses different soil symbols.

Soils in the study area have been altered by grading and the placement of fill material. Much of the soil in the immediate vicinity of the runways and taxiways includes imported gravels that were often highly compacted. In many cases, a thin layer (~5 inches) of soil had accumulated above this gravel layer. In several locations, where surface inundation/saturation and obligate vegetation were evident, these shallow soils did not meet the criteria for hydric or problem hydric soils outlined in the Interim Supplement (Corps 2006). In these cases, soils were considered hydric based on best professional judgment.

D.2 Hydrology

Hydrology was determined by the presence of saturation, water lines, drift marks or by inundation. Secondary indicators were used. The fieldwork was conducted in September, but there had been rain for much of the previous week. Field conditions were determined to be roughly analogous to typical growing season conditions and therefore neutral in affecting the presence of wetlands.

D.3 Vegetation

At each sample point, the absolute percent cover for each dominant species in the plot area was visually estimated and recorded. Each sample point has a 1.5-meter (5-ft) radius for herbs and a 9-meter (30-ft) radius for saplings, shrubs, trees and woody vines. The prevalence index was then calculated for these species.

The USFWS National List of Plant Species that Occur in Wetlands: Northwest (Region 10) and the supplement to that list were the references used to determine the indicator status of the vegetation. There were some grasses that could not be identified to species given the timing of the delineation.

Upland native vegetation in the study area typically included either dense Sitka spruce (*Picea sitchensis*) with sparse understory vegetation; or riparian vegetation including wavy-leaved alder, (*Alnus sinuata*), black cottonwood (*Populus balsamifera*), red elderberry (*Sambucus racemosa*), salmonberry (*Rubus spectabelis*), willows (*Salix spp.*), and an understory with lady fern (*Athyrium filix-femina*).

E Description of All Wetlands and Other Non-Wetland Waters

An overview of the wetlands and non-wetland waters in the study area vicinity is shown in Figure 5. There are seven wetlands in the study area. In addition there are three named streams and two unnamed stream networks. All of these streams pass through the study area, two in culverts. Because the study area is located on St. Paul Harbor it also includes marine shoreline.

E.1 Wetlands

Data from the fifteen plots (Appendix C) was analyzed and led to identification of seven wetlands. Color photographs of the plots and their locations are included in Appendix D. Six of the wetlands were dominated by emergent vegetation and one was a scrub shrub dominated wetland. One of the emergent wetlands also had a scrub shrub component.

E.1.1 Wetland A – E2EM1

Wetland A is a 9.6-acre intertidal estuarine wetland dominated by persistent emergent vegetation (Figure 5 and 6). It is entirely within the study area. The boundary of the wetland is clearly demarcated by topography and a change in vegetative community from salt-tolerant plant material to salt-intolerant plant material on the uphill side and to a mosaic of exposed river bed and mud flat. Data was collected at three sets of paired plots to determine the landward boundary location north, south and east of the Buskin River channel. Hydrology, soil and vegetation findings varied between locations.

Wetland A is saturated from a combination of sources. The primary source is daily tidal inundation. This is augmented with occasional fresh water inputs from high flows in the Buskin River. Precipitation and surface water flows from adjacent uplands associated with rainfall events also contribute to the wetland hydrology. The surface topography of the wetland varies slightly creating a mosaic of tidal plant communities based on their tolerance to tidal inundation.

The soils associated with this wetland are mapped by NRCS as Pasangshak very fine sandy loam, Sharatin-Made Land Complex, Made Land, and Water. Field assessment found that texture and color varied by location. Soils on the spit were sandy with a color of Gley1 7/10Y near the surface and Gley1 2.5/N at depth. Redox concentrations in the matrix and pore linings were common and prominent (7.5YR 3/4). South of the Buskin there was evidence of historic land surface alterations and the soil was more disturbed. Fine sandy silt (2.5YR 3/1) was above a layer of gravels with many distinct redox concentrations (5YR 4/8). On the north side of the Buskin River the soil was a mucky silty-sand (2.5Y 3/1) over a layer of sand and ash (10YR 6/4). Redox concentrations in the matrix were common and prominent (5YR 3/4).

The frequently inundated areas of the wetland are dominated by Lyngby's sedge (*Carex lyngbyei*) and mud sedge (*Carex limosa*). Higher, less frequently inundated elevations are dominated by a dunegrass (*Elymus mollis*) and bluejoint (*Calamagrostis canadensis*) community.

The national hydrogeomorphic (HGM) classification of this wetland complex is estuarine fringe with a subclass of tidal salt water.

E.1.2 Wetland B – PSS

Wetland B is a 0.15-acre palustrine scrub shrub wetland (Figure 5 and 6). It is located on a low terrace on the north bank of the Buskin River and is entirely within the study area. The boundary of the wetland coincides with the toe of slope of the bluff south of the river and a change in vegetative community from willow to alder and spruce. Data was collected at one set of paired plots to determine the landward boundary location north of the Buskin River channel.

Wetland B is primarily saturated from precipitation and precipitation-caused surface water flows from adjacent uplands. This is augmented with occasional fresh water inputs from high flows in the Buskin River. The surface topography of the wetland is a shallow linear depression that parallels the river channel and may be an abandoned side channel or a floodplain feature created by periodic floods.

The soil associated with this wetland is mapped by NRCS as Water or Pasangshak very fine sandy loam. Field assessment found that texture was silty clay loam over ash and then clay. The matrix color was 10YR 3/2 with common distinct concentration in the matrix of 5YR 4/6. This transitioned to a matrix of 5Y5/1 at depth common distinct redox concentrations (5YR 4/6) in the matrix and at pore linings.

The wetland is dominated by willow (*Salix spp.*) and bluejoint (*Calamagrostis canadensis*) with mud sedge (*Carex limosa*) in wetter areas.

The national HGM classification is depressional outflow.

E.1.3 Wetland C – PEM

Wetland C is a 0.25-acre palustrine emergent wetland located in a shallow depression (Figure 5 and 7). A culvert conveys water to the wetland at its southeastern tip. The wetland is adjacent to Runway end 11. The boundary of the wetland coincides with a distinct break in vegetation from tussock cottongrass and sedge to upland grasses and weeds and surface water ponding. The wetland gets shallower as it extends to the northwest. Data was collected at one plot to determine that this area was a wetland. A paired plot was not possible as we were unable to dig a pit due to compacted gravel material in areas without surface water hydrology and vegetation indicators.

Wetland C is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events. The surface topography of the wetland is a shallow linear depression that originates at a culvert outfall.

The soils associated with this wetland are mapped by NRCS as Made Land-Kodiak Complex. Field assessment found that texture was gravel in a matrix of clay loam. The color was Gley1 4/N near the surface. We were unable to dig below 6-inches due to a highly compacted gravel-cobble layer.

Vegetation in this area had been mown so the vegetation plot was increased to a 15-ft x 3-ft swath to document representative wetland vegetation. The wetland is dominated by obligate and facultative species including tussock cottongrass (*Eriophorum vaginatum*), sparseflower sedge (*Carex tenuiflora*), and meadow barley (*Hordeum brachyantherum*).

The national HGM classification is depressional outflow.

E.1.4 Wetland D – PEM

Wetland D is a 0.11-acre palustrine emergent wetland that is located in a linear depression adjacent to Runway 18/36 (Figure 5 and 7). A culvert conveys water to the wetland at its southeastern tip. The wetland is entirely within the study area. The boundary of the wetland coincides with a distinct break in vegetation from sedge to upland grasses, weeds and mown upland trees and shrubs. Surface saturation is coincident with this change in vegetation. The wetland gets shallower as it extends to the northwest and ends at a catch basin that drains to St Paul Harbor at Runway end 29. Data was collected at one set of paired plots to determine the boundary location.

Wetland D is saturated from precipitation and surface water flow from adjacent uplands associated with rainfall events. The surface topography of the wetland is a shallow linear depression that originates at a culvert outfall.

The soils associated with this wetland are mapped by NRCS as Made Land. Field assessment found that texture was a silt matrix with some gravel and a matrix color of 10YR 2/1 near the surface. We were unable to dig a pit below 4-inches due to a highly compacted gravel-cobble layer.

This highly altered wetland is dominated by obligate vegetation including sparseflower sedge (*Carex tenuiflora*) and a rush with no common name (*Juncus alpinus*).

The national HGM classification is depressional outflow.

E.1.5 Wetland E – PEM

Wetland E is a 0.22-acre palustrine emergent wetland that is located along the fringe of a linear drainage ditch (Figure 5 and 8). The ditch and the wetland fringe are interrupted by sections of culvert. The resulting series of wetland polygons parallels the taxiway adjacent to Runway 11/29 near Government Hill. It is entirely within the study area. This area is the low point in the drainage system as culverts convey water to the ditch and wetlands from both the northwest and the southeast to a catch basin at the base of Government Hill. From the catch basin water is conveyed by ditch to St. Paul Harbor at Runway end 29.

The boundary of the wetland coincides with a break in vegetation from mostly bluejoint to a mix of upland grasses and herbs. Data was collected at one set of paired plots to determine the boundary location.

Wetland E is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events and water flowing through the ditch. The surface topography of the wetland is steeply sloping banks and low terraces along a linear drainage that originates at culverts at both ends.

The soils associated with this wetland are mapped by NRCS as Made Land. Field assessment found that texture was clay with some gravel at depth. The matrix color was Gley1 4/10Y and included few indistinct redox concentrations above 8-inches.

The wetland is dominated by bluejoint (*Calamagrostis canadensis*).

The national HGM classification is riverine flow-through.

E.1.6 Wetland F – PEM

Wetland F is a 0.05-acre palustrine emergent wetland that is located in a depression just upslope of and adjacent to a drainage ditch along the taxiway south of Runway 7/25 (Figure 5 and 9). Water enters the ditch to the west from a natural drainage and the wetland has a surface water connection to that drainage. The wetland is entirely within the study area. The boundary of the wetland coincides with a distinct break in vegetation from sedge to rock and gravel. Surface water ponding is coincident with this change. Data was collected at one plot to determine that this area was a wetland. A paired plot was not possible as we were unable to dig a pit due to compacted gravel material near the surface in areas without surface water hydrology and vegetation indicators.

Wetland F is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events and possibly by groundwater. The surface topography of the wetland is a shallow depression at the base of a rock face.

The soils associated with this wetland are mapped by NRCS as Made Land-Kodiak Complex. Field assessment found that texture was a silty clay matrix transitioning to gravel. The matrix color was Gley1 5/10Y near the surface. We met refusal at 4-inches at a highly compacted gravel-bedrock layer. This soil was clearly reduced but was not underlain by soil of hue 5Y or redder. In light of the vegetation described below, the soil is considered Alaska Gleyed Without Hue 5Y or Redder Underlying Layer.

The wetland vegetation was dominated by obligate species such as common spikerush (*Eleocharis palustris*), ovate spikerush (*Eleocharis ovata)* and Kellogg's sedge (*Carex lenticularis var. lipocarpa)*.

The national HGM classification is depressional outflow.

E.1.7 Wetland G – PEM/PSS

Wetland G is a 0.09-acre palustrine emergent palustrine scrub shrub wetland that is located along the fringe of a linear drainage ditch that parallels the Chiniak Highway just west of the airport terminal (Figure 5 and 9). It begins inside the study area but continues to the north, off the Airport and outside the study area. A culvert conveys water to the ditch and wetlands at the southwest end of the wetland. Additional water enters from a second culvert under the Chiniak Highway. This channel leaves the study area and flows to the Buskin River.

The boundary of the wetland coincides with a break in vegetation from sedges, rushes, and willow to either gravel with moss and mown alder and spruce or upland grasses and herbs. Data was collected at one plot to determine that this area was a wetland. A paired plot was not possible as we were unable to dig a pit due to compacted gravel material the surface in areas without surface water hydrology and vegetation indicators.

Wetland G is saturated from precipitation and surface water flows from adjacent uplands associated with rainfall events and water flowing through the ditch. The surface topography of the wetland is gently sloping banks and low terraces along a linear drainage that originates at a culvert.

The soils associated with this wetland are mapped by NRCS as Made Land-Kodiak Complex. Field assessment found that texture was a sandy clay loam with gravel at 5 inches. Matrix color

was 10YR 2/2 near the surface. We were unable to dig a pit below 5-inches due to a highly compacted gravel-cobble layer.

The wetland is dominated by obligate plants such as Kellogg's sedge (*Carex lenticularis var. lipocarpa),* a rush with no common name (*Juncus alpinus*) and tufted hair grass (*Deschampsia cespitosa*). Willow (*Salix spp.*) dominates the scrub shrub portion of the wetland.

The national HGM classification is riverine flow-through.

E.2 Non-Wetland Waters

There are a number of waterways in the immediate project vicinity (Figure 5). A majority either flow through the study area in natural channels or ditches or are piped through the study area below ground. All of these waterways have been altered by human activity in some way. More information on the hydrology and geomorphology of study area surface waters is found in the Water Resources Technical Memorandum (VAI 2008).

E.2.1 Buskin River

The largest of the study area streams is the Buskin River, which drains a watershed that is 25-mi^2 in size. The river originates west of the study area and drains to St. Paul Harbor just north of Runway ends 18 and 25. This river and its riparian buffer generally form the northern boundary of the study area. The mouth of the Buskin River is tidally influenced and includes a small estuary. The Buskin River channel and estuary were altered by the construction and maintenance of the Airport. The river was moved north by man-made fills and the estuary was altered and possibly enlarged by grading and other earthwork, and/or the 1964 earthquake and tsunami.

E.2.2 Louise Creek

Louise Creek joins the Buskin River in the project vicinity just north of the study area.

E.2.3 Devil's Creek

Devil's Creek begins south of the study area and enters a culvert under Runway 7/25 as it crosses the study area boundary. The creek emerges from the culvert on the north side of the runway and flows above ground for about 100-feet before leaving the study area and flowing to the Buskin River. The Creek has been straightened both upstream and downstream of the culvert and in some places has been lined with wood.

E.2.4 Unnamed Stream 1

Unnamed stream network 1 begins west of the study area just west of Runway end 7. This natural drainage network enters a system of ditches and culverts in the study area at the west end of the runway. This constructed drainage parallels the Chiniak Highway beyond the study area boundary and eventually drains to the Buskin River.

E.2.5 Drury Gulch

Drury Gulch is a small intermittent stream that has been significantly altered. It enters the study area in a below-ground pipe and discharges into St. Paul Harbor at Runway end 25.

E.2.6 Unnamed Stream 2

Unnamed stream network 2 that begins on Aviation Hill and flows to the east along the south side of the south taxiway of Runway 7/25. It is within the study area boundary. The streams enter the storm system and are carried to St. Paul Harbor in pipes under the runways.

E.2.7 Marine Shoreline

The Airport is located on the shore of St. Paul Harbor in Chiniak Bay and is subject to tidal inundation. Several areas within the study area have lands that are tidally influenced. These include Finny Beach (locally referred to as Jewel Beach), the shore off of Runway ends 36 and 29, and sections of the barrier bar and shore off of Runway ends 25 and 18. Figure 5 illustrates the high tide line in the context of the study area boundary.

F Deviation from NWI and other sources

Figure 4 shows wetland polygons mapped by the National Wetlands Inventory (NWI) Kodiak Quads C-2 and D-2. The NWI indicates there are several wetlands within the study area and classifies them as follows according to the US Fish and Wildlife Service (Cowardin, et al, 1992):

- PSS1A – Palustrine Scrub Shrub\Broad-Leaved\Temporarily Flooded
- R1RBV – Riverine\Tidal\Rock Bottom\Permanent Tidal
- R3UBH – Riverine\Upper Perennial\Unconsolidated Bottom\Permanently Flooded
- E1UBL – Estuarine\Subtidal\ Unconsolidated Bottom\Subtidal
- E2EM1P – Estuarine\ Intertidal\Emergent\Persistent\Irregularly Flooded
- M2USS – Marine\Intertidal\Unconsolidated Shore\Temporary-Tidal
- M2USN – Marine\Intertidal\Unconsolidated Shore\Regularly Exposed

A Wetland Delineation Study of the Coast Guard Integrated Support Command was conducted in1999 (Dames & Moore). However, this study was limited to the verification of the findings of the NWI and did not identify any wetlands that were not mapped in the NWI.

G Mapping Method

All wetland data plots and wetland boundaries were recorded using a 2005 Trimble GeoXT Global Positioning Systems (GPS). This unit has an inherent horizontal positional accuracy of +/- 3 feet. Following data processing to remove outlying point positions, point features had a minimum horizontal accuracy of +/- 3.0 feet. Line features shown in the figures have a minimum horizontal accuracy of +/- 3.0 feet. Extensive canopy cover prohibited a higher degree of accuracy during data collection, and in some cases field measurements were required to precisely locate data points. Field maps that included high resolution air photo and topographic survey data were used to note the locations of key features observed in the field. These data along with 1-foot survey data and tidal elevation data were used to refine point and boundary locations.

H Additional Information

H.1 High Tide Line

The high tide line (HTL) elevation was determined by cross referencing published HTL elevations for Alaska (Corps 2008) with the project area survey and tidal elevations (Table 3). The interpolated HTL elevation, 11.7 feet, appeared slightly high compared to field observations of the upward extent of salt tolerant vegetation. Therefore, for this delineation report, the 11-foot contour line was used to demarcate the boundary. The 8-foot contour was used as the mean high water (MHW) line.

Table 3. Study Area Tidal Elevations

	Corps Alaska Tide Data* (feet-MLLW)	Project Survey** (feet-NAVD88)
Extreme High Water (EHW)	13.0	14.0
High Tide Line (HTL)	10.7	--
Mean Higher High Water (MHHW)	8.5	9.5
Mean High Water (MHW)	7.6	8.6

H.2 Head of Tide

No published data defining the head of tide for the Buskin River was found. Therefore, the location of the head of tide was determined in the field based on observations of changes in stream bed material and channel morphology. Based on these observations the head of tide was determined to be upstream of the old bridge location where the channel transitions from a single channel to a braided channel network (Figure 6). There is no evidence of frequent inundation on the floodplain of the Buskin River between the old bridge and head of tide. Changes in water surface elevation associated with tides are contained within the banks of the active channel through this reach. Wetland B is located in this area. It had dense herbaceous cover and appeared to be inundated primarily by surface water runoff from adjacent land during rainfall events.

H.3 Drainage Ditches and Culverts

The Storm Water Pollution Prevention Plan (SWPPP) for Kodiak Airport (Shannon & Wilson 2000) was reviewed for this report and provided an understanding of the ditch and pipe drainage network at the airport (Appendix E). This enabled correlation between the receiving waters for various wetlands as well as the source of their hydrology, and aided in the jurisdictional determinations.

I Results and Conclusions

I.1 Waters of the U.S.

Waters of the United States (U.S.) include marine waters and tidal areas below mean high water as well as rivers (below ordinary high water (OHW)), lakes and some wetlands. Marine waters in the project vicinity, below MHW (8 feet), fall under the jurisdiction of the Corps under Section 10 of the Rivers and Harbors Act. This jurisdiction extends to the head of tide which, on the Buskin River, is located just upstream of the old bridge crossing (Figure 6). The shore of St.

Paul Harbor, the Buskin River below head of tide, and the lower elevation areas of Wetland A (6.74 acres) meet these criteria.

The Buskin River above head of tide is not on the Alaska Corps list of navigable waters but this river and its estuary are a fishing destination for fishermen both in the U.S. and abroad. As a source of interstate commerce the river below OHW would be considered a Water of the U.S. The Corps also takes jurisdiction over tributaries to Waters of the U.S. Based on these criteria – and the Corps jurisdiction over marine waters – the Buskin River, Louise Creek, Devil's Creek, Unnamed Stream 1, and Unnamed Stream 2 would all be regulated by the Corps as Waters of the U.S.

I.2 Wetlands

Wetlands between MHW (8 feet) and the HTL (11 feet) are regulated as coastal wetlands and fall under the Corps jurisdiction under Section 404 of the Clean Water Act. The upper elevation areas of Wetland A (5.66 acres) meet this criterion.

Section 404 of the Clean Water Act gives the Corps jurisdiction over fresh water wetlands above the OHW line of streams. These wetlands must be connected to waters of the U.S. either by wetlands, surface drainages, or culverts. Of the seven wetlands identified in the study area, all are connected to either the Buskin River or St. Paul Harbor either through channels or pipes. This direct connection supports a jurisdictional determination by the Corps.

Wetlands A and B have the most direct connection. They are located on the floodplain of the Buskin River. Wetland A falls under Corps jurisdiction as a tideland below MHW and as a coastal wetland between MHW and HTL. Wetland B is located on a terrace of the Buskin River. The wetland is occasionally inundated by high river flows. Technically, a small area of this wetland is below HTL but field observations do not support the conclusion that the area is inundated daily by tides.

Wetlands E, F and G are each connected to a ditch system that originated in a natural stream. Water flows from these ditches via culverts to either the Buskin River or St. Paul Harbor. Wetland E and Wetland F are connected to the same ditch. It is fed by flow from Unnamed Stream 2 and drains to St. Paul Harbor. Wetland G is located on the fringe of a straightened ditch that is fed by flow from Unnamed Stream 1. This channel drains to the Buskin River west of the study area.

Wetland C and D are both fed by runoff from the airport infield and are drained by culverts to either the Buskin River or St. Paul Harbor. Wetland C is a small depression on the airport infield that drains to the Buskin River. Wetland D is a small depression that drains to St. Paul Harbor.

I.3 Conclusions

Seven jurisdictional wetlands were identified and delineated within the project area as shown in Figure 5 to 7 and summarized in Table 4.

Table 4. Jurisdictional Wetlands in the Kodiak Airport EIS Study Area				
Wetland ID	Dominant Cowardin Class	Acres Within Project area	Sample Plot(s)	HGM Classification
A	E2EM1	9.6 acres	Plot A1-A6	EF,TSW
B	PSS	0.15 acres	Plot B1-B2	D,O
C	PEM	0.25 acres	Plot C1	D,O
D	PEM	0.11 acres	Plot D1-D2	D,O
E	PEM	0.22 acres	Plot E1-E2	R,FT
F	PEM	0.05 acres	Plot F1	D,O
G	PEM/PSS	0.09 acres	Plot G1	R,FT

1. Cowardin Wetland Classification: E2EM = Estuarine intertidal persistent emergent, PEM = Palustrine Emergent Wetland, PSS = Palustrine Scrub-Shrub;

2. Brinson Hydrogeomorphic Classification: D = Depressional, R = Riverine, EF = Estuary Fringe;
Subclass: F = Flow-through, O = Outflow, TSW = Tidal Salt Water

J Disclaimer

This report documents the investigation, best professional judgment, and conclusions of the investigators. It should be considered a **Preliminary Jurisdictional Determination** until it has been approved in writing by the Corps of Engineers.

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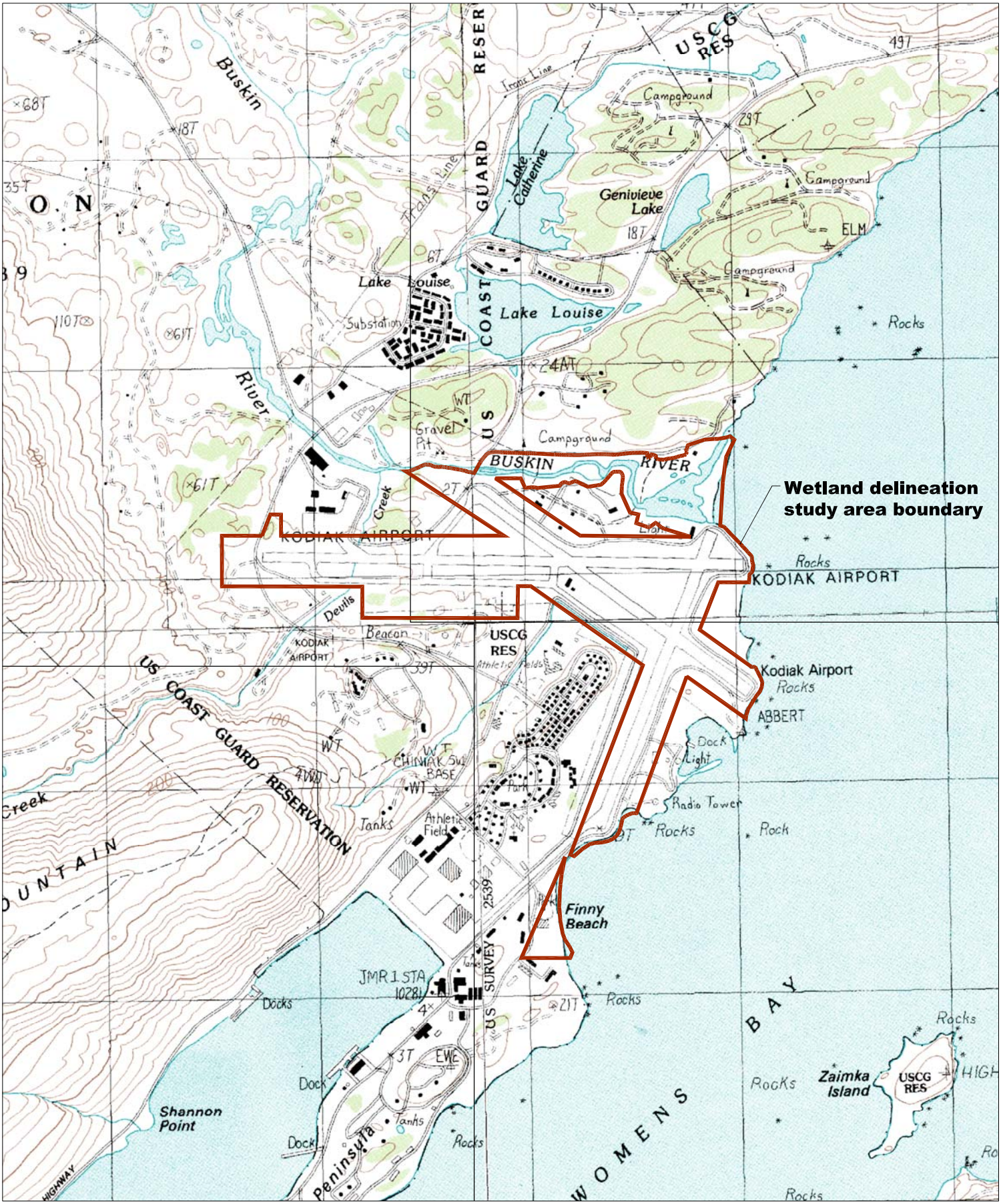
Appendices

Appendix A: Figures



Source: USGS topo quad: Kodiak C-2 NE & NW, D-2 SE & SW, 1987

FIGURE 1.
Vicinity Map

VIGIL AGRIMIS
design professionals

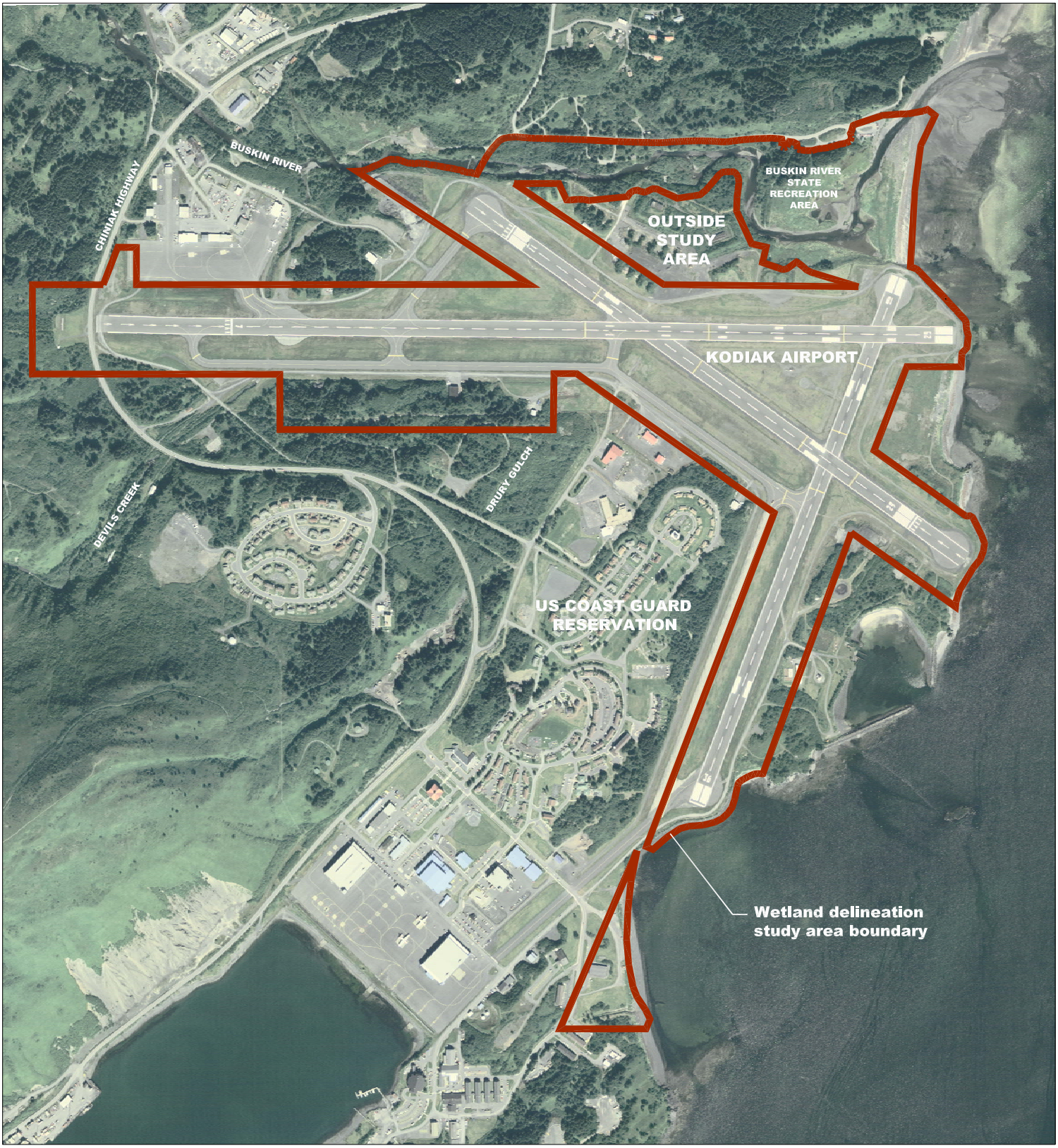
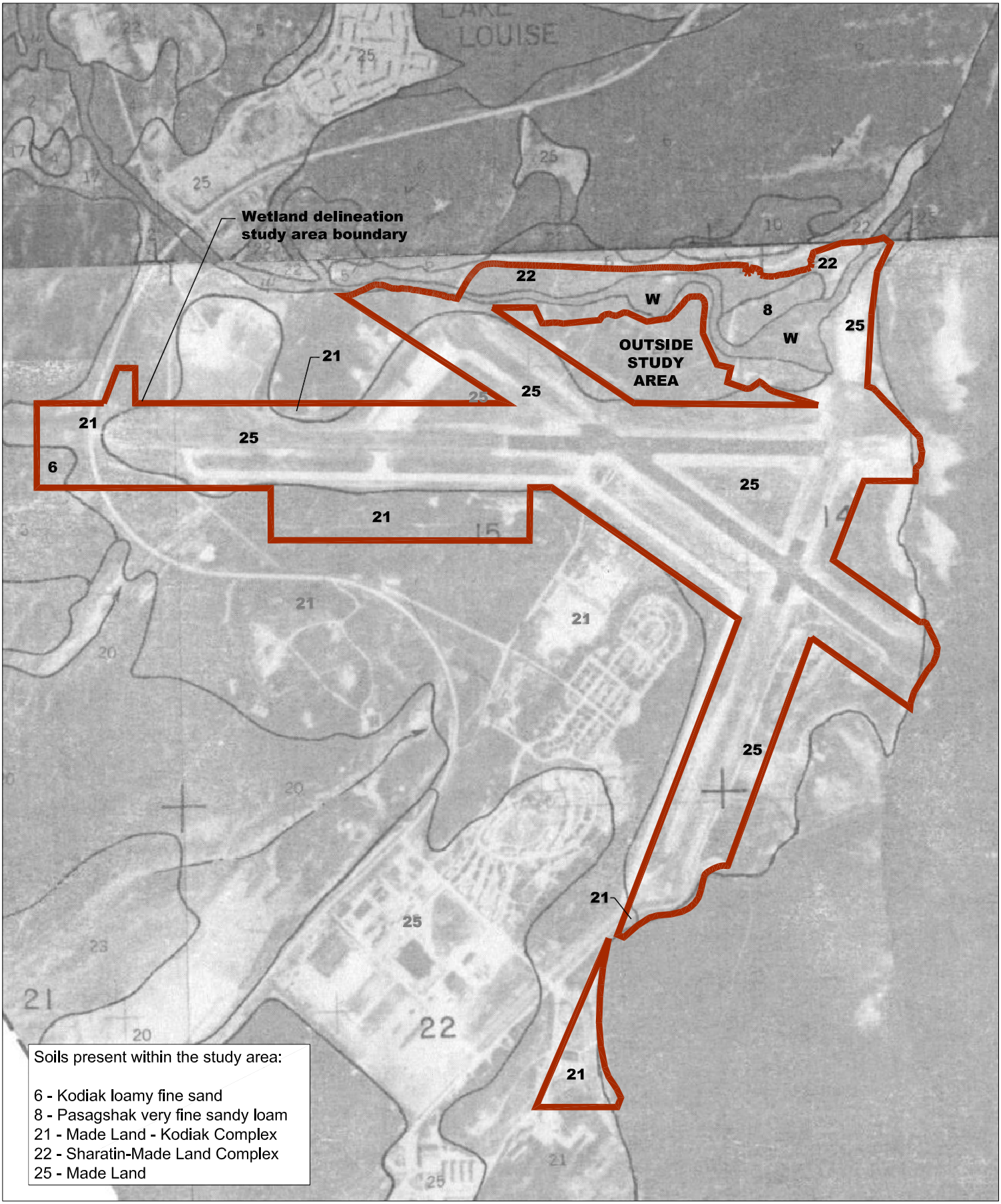


FIGURE 2.
2004 Aerial Photograph

VIGIL AGRIMIS
design professionals



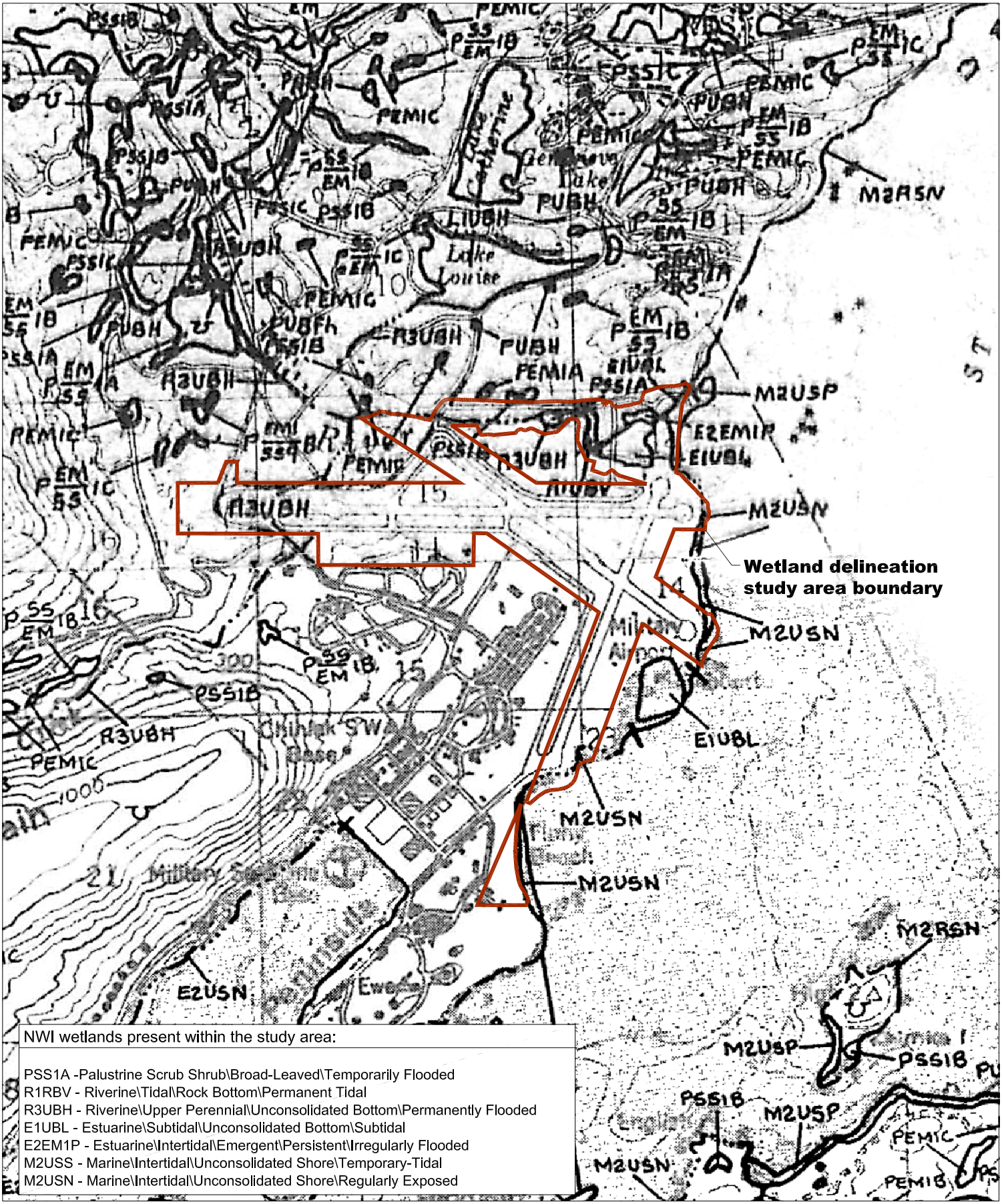
Source: USDA SCS Soil Survey for U.S Coast Guard Reservation, 1980

FIGURE 3.
Soils

SCALE 0 300 600 1200 FEET
1" = 1200'

NORTH

VIGIL AGRIMIS
design professionals



Source: NWI quad: Kodiak C-2 & D-2, 1988

FIGURE 4.
National Wetlands Inventory

SCALE 0 500 1000 2000 FEET
1" = 2000'

NORTH

VIGIL AGRIMIS
design professionals

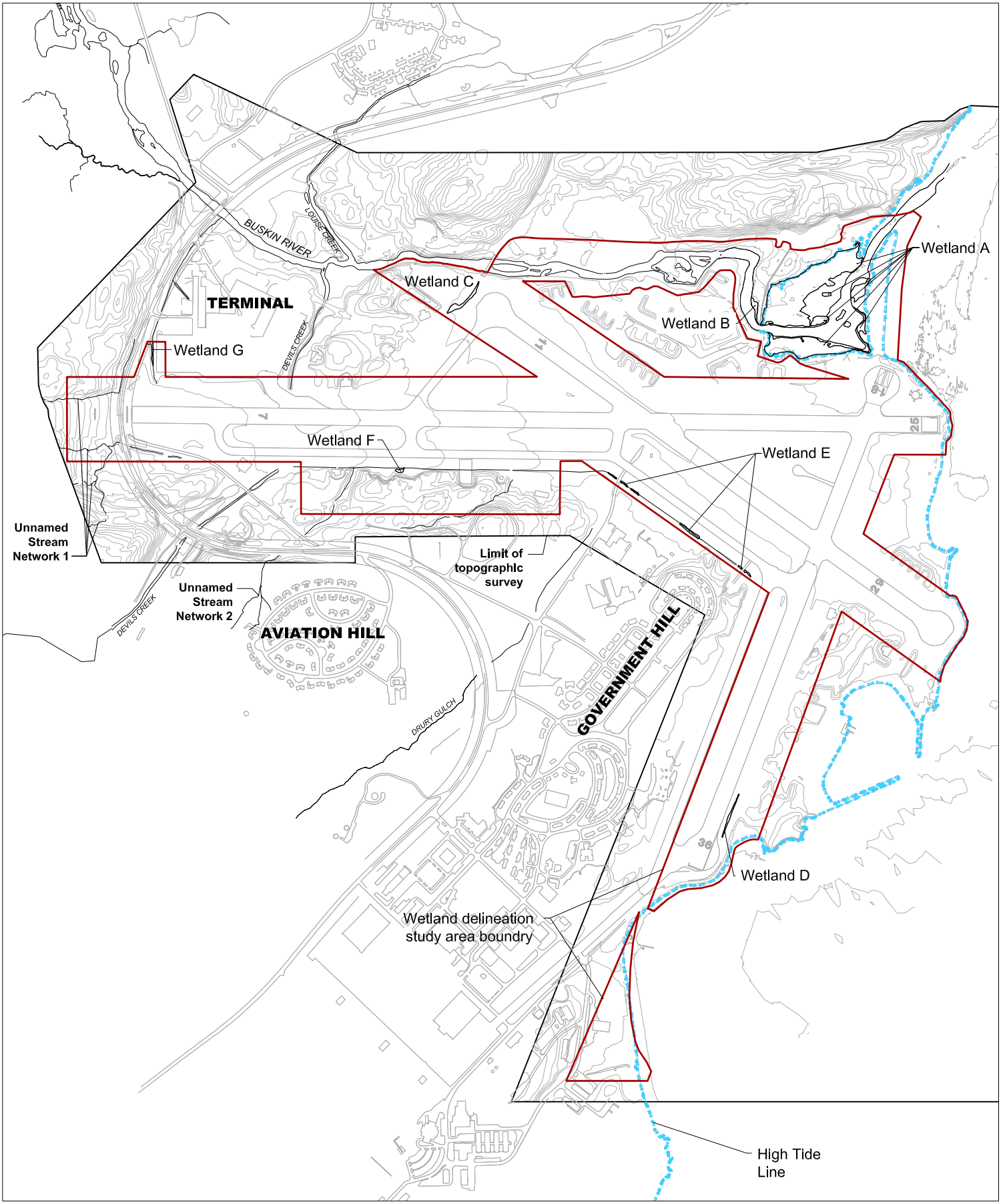
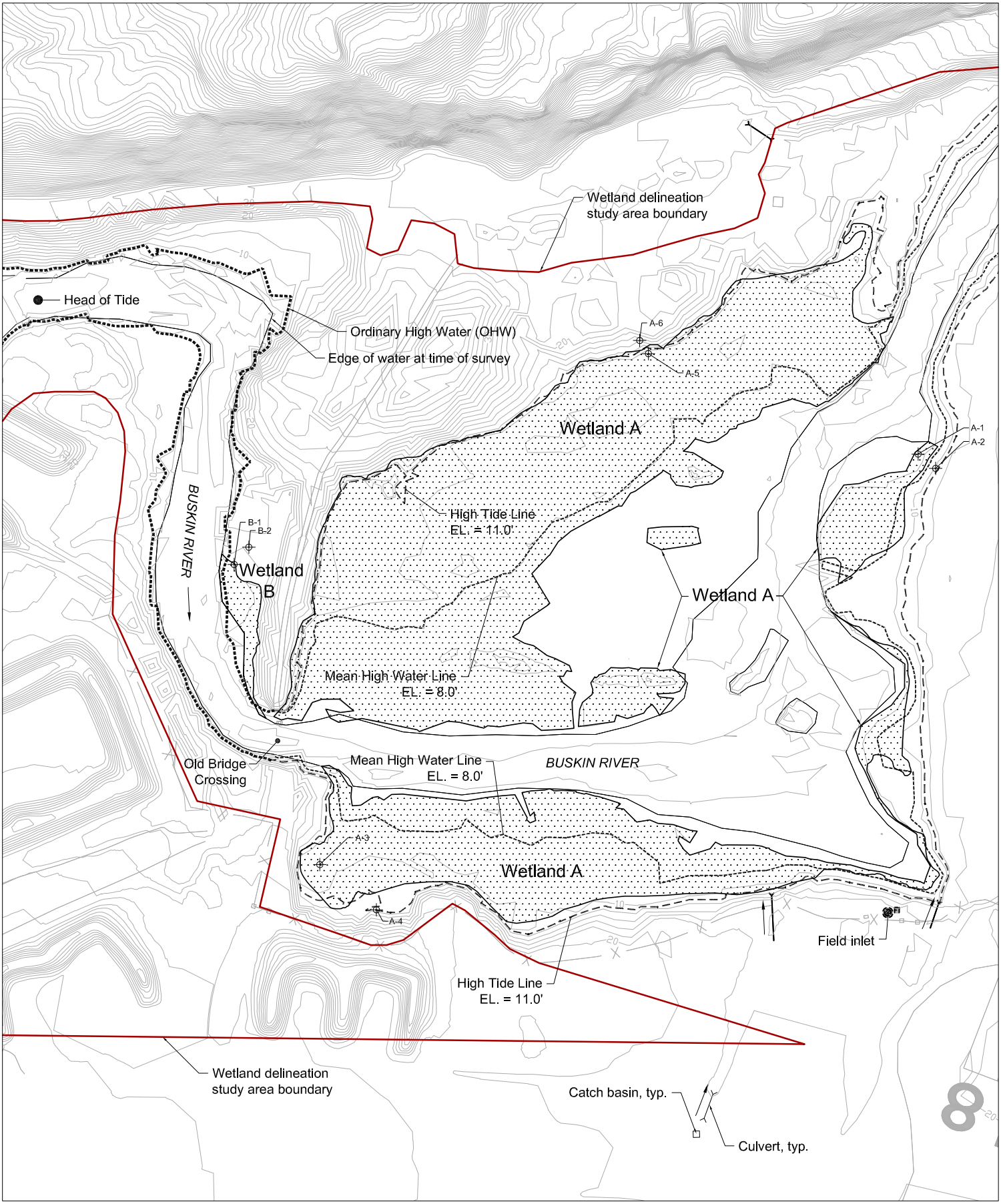


FIGURE 5.
Overview of Delineated Wetlands & Non-wetland Waters

VIGIL AGRIMIS
design professionals



0 50 100 200
SCALE
1" = 200'
FEET

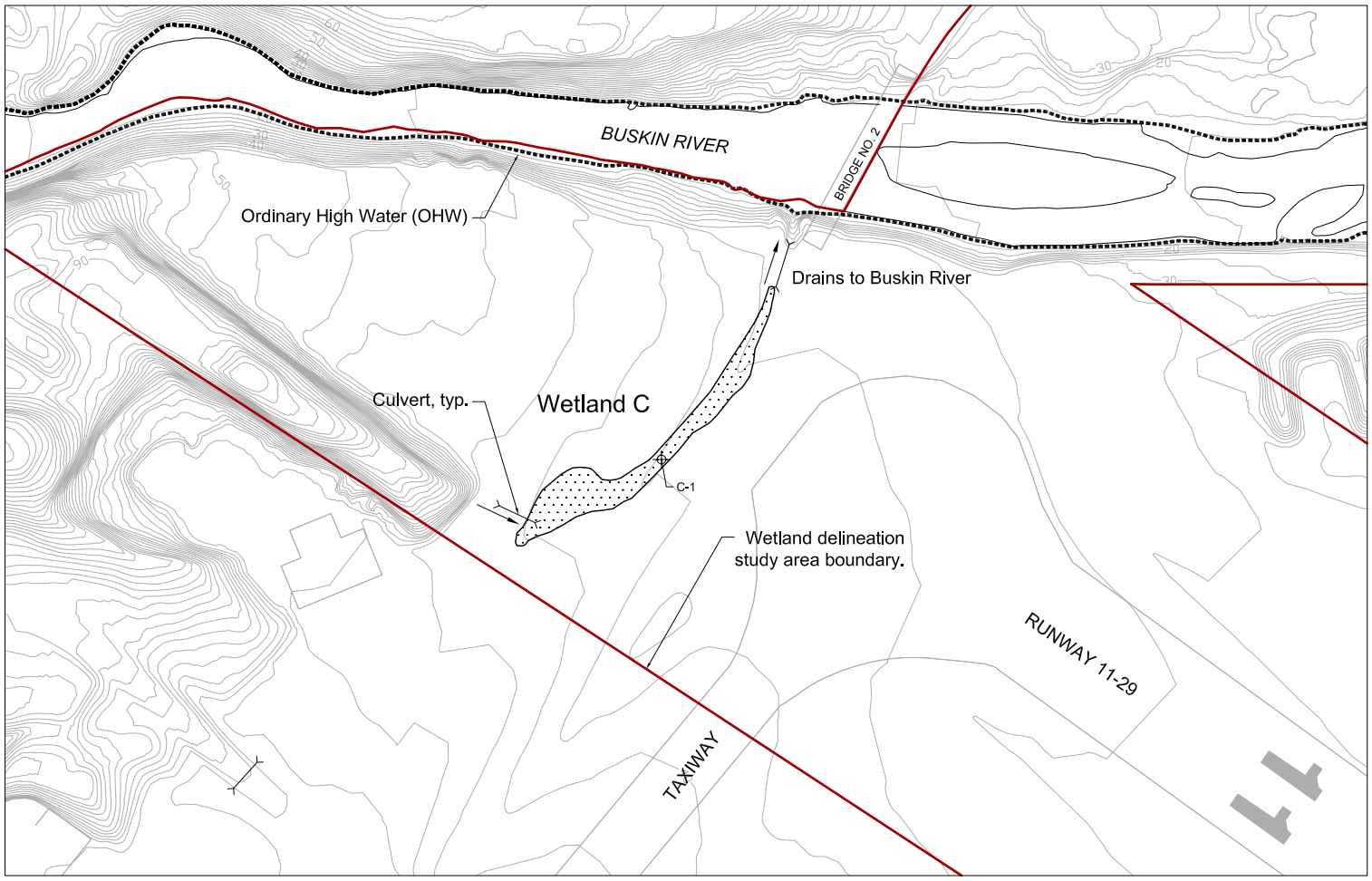
NORTH

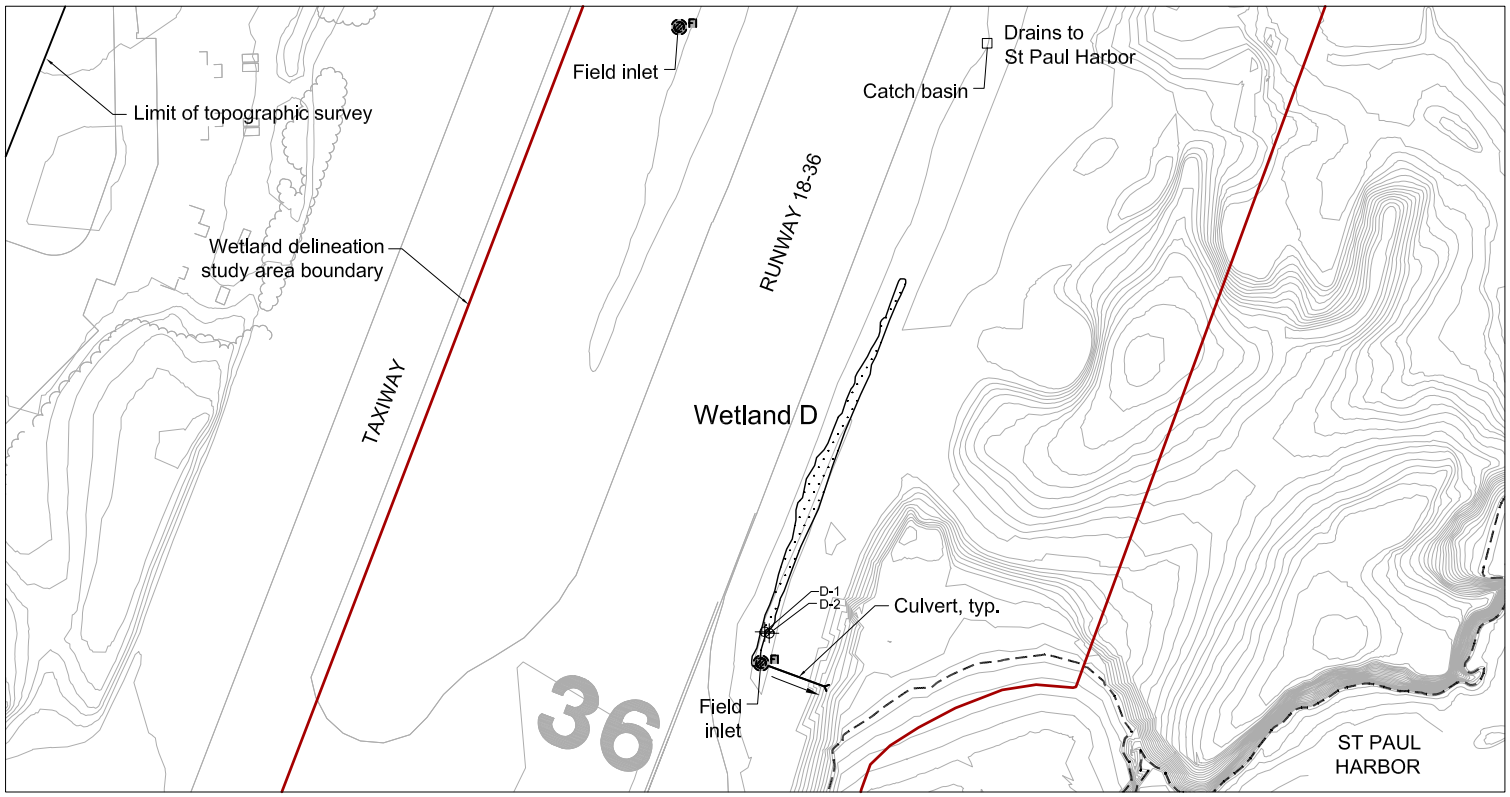
LEGEND

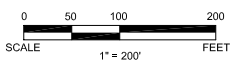
- Wetlands
- High Tide Line EL. = 11.0'
- Mean High Water LineEL. = 8.0'
- Ordinary High Water

FIGURE 6.
Wetlands A & B

VIGIL AGRIMIS
design professionals







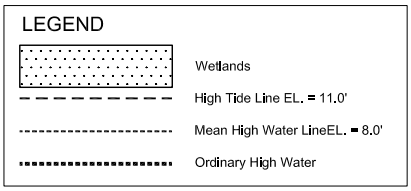


FIGURE 7.
Wetlands C & D

VIGIL AGRIMIS
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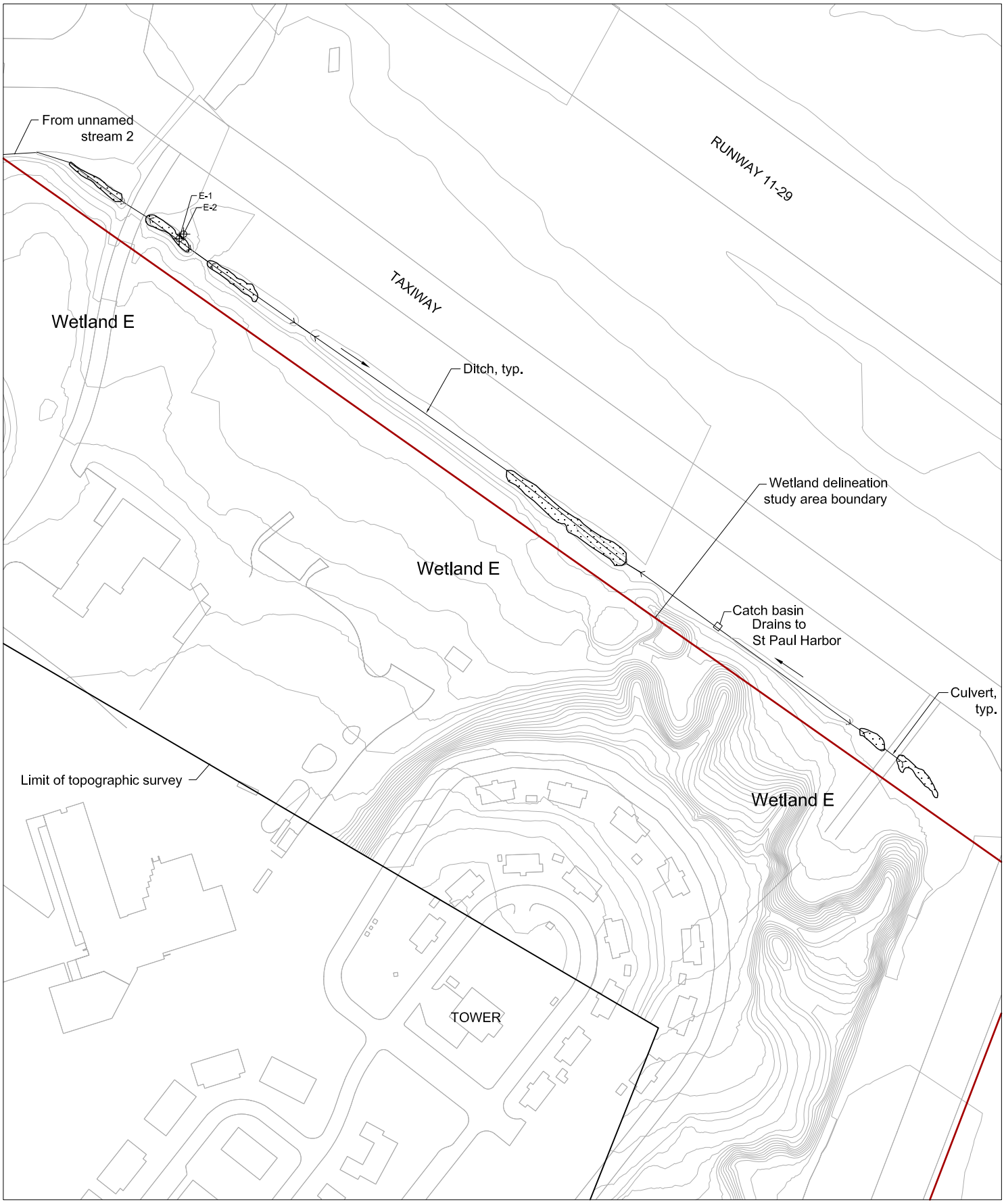

FIGURE 8.
Wetland E

VIGIL AGRIMIS
design professionals

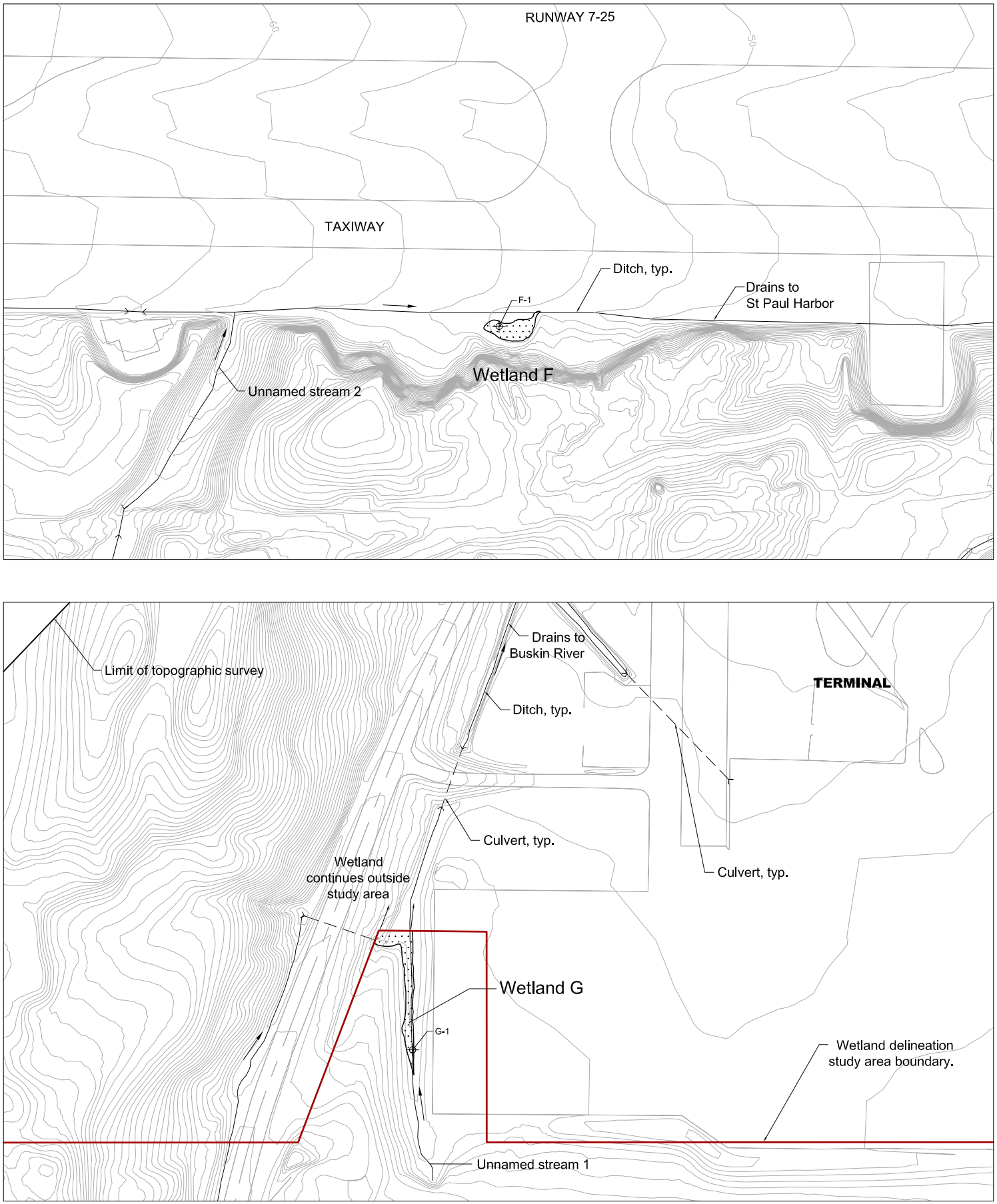

FIGURE 9.
Wetlands F & G

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design professionals

Appendix B: WETS Station Data

WETS Station : KITOI BAY, AK4812 Creation Date: 08/25/1999
Latitude: 5811 Longitude: 15221 Elevation: 00010
State FIPS/County(FIPS): 02150 County Name: Kodiak
Start yr. - 1961 End yr. - 1990

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	Precipitation (Inches) avg	30% chance will have less than	more than	avg # of days w/.1 or more	avg total snow fall
January	33.5	23.8	28.6	6.38	4.12	7.68	14	15.2
February	34.4	23.6	29.0	4.86	3.21	5.83	11	14.9
March	38.1	25.4	31.7	4.47	2.98	5.35	11	9.7
April	42.4	29.4	35.9	4.49	3.45	5.22	11	4.6
May	48.7	35.9	42.3	5.37	3.86	6.34	12	0.5
June	54.5	42.5	48.5	4.43	3.17	5.24	9	0.0
July	60.3	47.5	53.9	3.38	2.40	4.01	8	0.0
August	61.2	47.7	54.5	5.20	3.44	6.24	10	0.0
September	54.9	42.9	48.9	6.73	5.50	7.65	12	0.0
October	44.9	33.2	39.0	6.36	4.97	7.35	11	1.5
November	37.1	27.5	32.3	5.48	3.68	6.55	11	5.2
December	33.9	24.0	29.0	6.12	3.83	7.39	13	11.8
Annual	-----	-----	-----	------	51.48	67.59	--	----
Average	45.3	33.6	39.5	------	------	------	--	----
Total	-----	-----	-----	63.28	------	------	133	63.4

GROWING SEASON DATES

Probability	Temperature: 24 F or higher	28 F or higher	32 F or higher
	Beginning and Ending Dates Growing Season Length		
50 percent *	4/13 to 10/24 (194 days)	5/ 5 to 10/ 9 (157 days)	5/23 to 9/28 (128 days)
70 percent *	4/ 3 to 11/ 3 (214 days)	4/26 to 10/17 (174 days)	5/17 to 10/ 4 (140 days)

* Percent chance of the growing season occurring between the Beginning and Ending dates.
total 1955-1999 prcp

Station : AK4812, KITOI BAY
------- Unit = inches

yr	jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	annl
55	M6.57	3.69	4.58	2.94	10.45	5.20	4.60	3.66	3.95	8.08	5.70	1.86	61.28
56	2.08	M3.05	4.65	4.03	8.12	2.27	3.82	5.85	5.75	M3.26	M4.45	M3.79	51.12
57	2.58	M1.52	7.14	5.38	3.56	0.61	2.25	M5.63	11.16	10.12	7.58	5.18	62.71
58	9.67	8.07	M4.62	M4.38	M3.68	5.89	M8.69	M5.95	4.34	4.03	4.90	7.25	71.47
59	M7.16	3.04	M4.69	4.07	3.52		5.40	2.92	4.88	5.96	M13.32	M5.39	60.35
60	8.10	M8.21	4.65	M4.90	4.18	4.65	4.05	M5.19	M5.66	7.25	6.13	9.23	72.20
61	M7.80	M4.06	2.69	M1.53	M5.33	M2.70			M2.53	5.16	M2.70	M3.65	38.15
62	M4.96	1.44	M3.58	3.84	4.75	1.90		M1.30	6.20	5.43	6.44	7.57	47.41
63	6.86	5.04	2.09	4.10	2.31	2.97	1.55	4.86	5.50	5.59	3.59	9.91	54.37
64	M7.64	M6.32				M0.10	1.27	5.34	3.02	4.64	4.47	4.33	37.13
65	5.73	3.37	5.19	3.45	3.85	6.63	3.06	1.50	9.55	6.66	7.07	3.63	59.69
66	7.74	1.63	4.76	3.64	2.61	3.29	3.59	7.84	8.16	8.43	2.56	4.16	58.41
67	2.83	4.57	1.64	3.50	1.75	4.13	1.33	12.41	7.86	4.53	4.99	4.99	54.53
68	1.88	6.76	4.13	4.88	4.28	2.76	3.13	5.24	5.26	4.63	8.18	4.71	55.84
69	1.26	M3.77	5.66	7.06	6.54	6.00	2.54	3.99	8.09	11.53	5.39	10.65	72.48
70	3.50	8.57	7.87	1.71	3.84	1.75	5.00	7.10	5.39	4.92	2.90	4.90	57.45
71	3.86	7.92	4.41	M4.90	13.02	5.59	8.22	4.21	7.21	7.27	3.79	M5.11	75.51
72	3.35	4.26	0.58	1.48	7.58	4.45	2.53	11.30	5.59	6.08	7.59	1.87	56.66
73	3.36	3.97	3.38	M4.39	8.84	2.14	3.56	3.14	6.20	M5.15	1.01	6.00	51.14
74	5.18	M3.60	3.35	5.64	4.51	3.67	1.78	5.63	7.87	10.74	5.65	1.44	59.06
75	3.65	3.90	3.06	4.40	8.39	4.65	2.15	M3.33	M6.68	6.29	5.22	M4.95	56.67
76	5.53	1.86	1.45	4.13	3.76	3.41	3.46	9.23	11.42	4.04	12.84	M8.27	69.40
77	13.36	9.99	3.04	5.74	5.43	3.86	1.32	M8.24	3.11	9.72	1.46	1.59	66.86
78	4.26	4.72	3.12	5.22	8.72	2.01	3.56	4.18	6.15	9.81	3.50	8.56	63.81
79	5.62	0.69	6.14	3.46	5.63	4.55	3.84	6.06	8.49	8.31	4.43	M2.42	59.64
80	4.78	8.99	6.36	8.01	7.86	3.87	2.28	3.51	8.21	11.30	8.75	4.84	78.76
81	15.93	7.11	9.23	4.90	5.67	3.76	4.07	5.11	5.91	4.36	8.08	M5.75	79.88
82	6.80	3.60	3.25	M5.20	6.59	6.31	4.45	1.87	8.50	2.17	4.99	11.58	65.31
83	M7.25	6.43	5.44	M3.58	9.55	4.95	2.65	1.52	3.96	5.44	13.00	2.56	66.33
84	7.70	M5.78	8.67	6.13	3.97	5.77	2.24	3.41	6.26	3.34	6.55	4.40	64.22
85	13.68	2.54	5.56	6.19	2.68	5.05	7.48	3.70	5.37	4.73	3.66	17.41	78.05
86	10.60	5.39	2.87	2.24	2.66	9.31	3.17	7.76	4.29	7.94	6.59	12.33	75.15
87	12.03	4.76	7.26	5.39	4.70	13.28	2.69	2.15	8.23	5.72	5.18	2.26	73.65
88	7.31	8.83	7.60	6.63	3.13	2.24	2.63	6.40	4.42	7.05	7.82	10.35	74.41
89	2.76	M2.38	2.50	4.99	3.07	4.52	5.45	7.63	8.01	5.98	M3.98	8.90	60.17
90	5.44	2.66	3.81	3.98	4.68	3.02	5.77	5.94	10.32	3.88	1.91	4.22	55.63
91	3.58	8.08	1.51	9.82	9.67	6.73	2.54	3.67	8.01	5.20	11.90	6.11	76.82
92	7.12	3.04	5.86	3.31	3.20	4.91	4.96	8.02	1.45	3.80	4.39	4.82	54.88
93	M3.00	5.92	6.56	7.81	5.87	1.58	2.06	9.38	4.29	7.70	4.41	10.17	68.75
94	9.39	4.68	6.04	6.69	7.84	2.96	7.57	1.32	7.78	12.14	3.04	8.09	77.54
95	7.88	5.95	2.82	6.90		4.84	4.57	5.54		10.55	2.09	8.82	59.96
96	M2.93	3.16	2.84	8.34	1.81	5.67	3.79	3.43	7.28	3.54	3.92	7.50	54.21
97	11.40	8.90	M1.86	5.81	2.34	1.13	2.32	3.04	10.30	5.11	M5.41	M7.51	65.13
98	9.29		7.62	7.16	7.29	6.54	5.20	4.50	7.06			4.77	59.43
99													

Appendix C: Data Forms

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.11.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: A-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): Flat

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Carex limosa*	TR	OBL
2. *Carex lyngbyei*	50%	OBL
3. *Cochlearia officinalis*	10%	FACW
4. *Honkenya peploides*	10%	OBL
5. *Puccinellia phryganodes*	TR	OBL
6. *Puccinellia hultenii*	15%	OBL
7. *Spergularia canadensis*	7%	FACW
8. *Triglochin maritimum*	TR	OBL
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 50%

Plot size 1-meter radius % Bare Ground 50%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

	Total % Cover of:	Multiply by:
OBL species	65	x 1 = 65
FACW species	17	x 2 = 34
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	82 (A)	89 (B)

Prevalence Index = B/A = 1.21

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: A-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	2.5Y 3/1						Sandy	
4-7"	Gley 1 7/10Y						Sandy	some organics at bottom
7-16"	Gley 1 2.5 N		7.5 YR 3/4	7%	C	PL M	Sandy	redox in top 3"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- X Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- X Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 12"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This area was dry at 11:40. It was inundated later in the day @ 1:40 pm

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.11.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: A-2

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): Dune

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis scabra*	40%	FAC
2. *Elymus mollis*	45%	FAC
3. *Epilobium angustifolium*	15%	FACU
4. *Picea sitchensis*	TR%	FACU
5.		
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16.		
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20.		

Total Cover: 100%

Plot size 9-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 85	x 3 = 255
FACU species 15	x 4 = 60
UPL species _____	x 5 = _____
Column Totals: 100	(A) 315 (B)

Prevalence Index = B/A = 3.15

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: A-2

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	Gley 1 2.5 N		No				Coarse sand; medium 2-5mm w/?	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- _ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

"Soil" color is that of parent gravel material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The ground was moist due to recent rain; coarse sand gravel. Soil parent material was gley color.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.11.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: A-3

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): Flat

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Rusting barrels upslope may be source of rust coloring in soils.

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Calamagrostis canadensis*	15%	FAC
2. *Elymus mollis*	85%	FAC
3. *Rumex obtusifolius*	TR%	FACW
4.		
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16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 100	x 3 = 300
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 100	(A) 300 (B)

Prevalence Index = B/A = 3.00

Other Indicators of Hydrophytic Vegetation:
(Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: A-3

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	2.5Y 3/1	100%	No				Sandy silt; fine	
4-6"	10YR 3/2		5YR 4/6 & 2.5 YR 4/8				Silty sand	
6-16"	10YR 3/2		2.5 YR 4/8		C	M	large cobbles with oxidiation	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- X Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- _ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Rusting barrels just upslope of plot @ edge of runway fill; may be source of redox but unlikely.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- X Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): _____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Recent rain; Shallow depression; probably inundated by surface runoff from airport and high tides.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.12.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: A-4

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): slope

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Alnus sinuata*	50%	FAC
2. *Athyrium filix-femina*	15%	FAC
3. *Picea sitchensis*	TR%	FACU
4. *Rubus spectabilis*	10%	FACU
5. *Sambucus racemosa*	50%	FACU
6. moss	60%	
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 9-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 65	x 3 = 195
FACU species 60	x 4 = 240
UPL species _____	x 5 = _____
Column Totals: 125 (A)	435 (B)

Prevalence Index = B/A = 3.48

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: A-4

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 3/2	100%	None				Silty sandy loam w/cobbles 3" max. some iron from	
								old oil cans in the area

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- _ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Moist from rain

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.12.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: A-5

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): Flat

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No _____ Hydric Soil Present? Yes X No _____ Wetland Hydrology Present? Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Calamagrostis canadensis*	10%	FAC
2. *Carex limosa*	75%	OBL
3. *Carex lyngbyei*	15%	OBL
4. *Hordeum brachyantherum*	5%	FAC
5. *Poa eminens*	35%	FAC
6.		
7.		
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14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species 90	x 1 = 90
FACW species _____	x 2 = _____
FAC species 50	x 3 = 150
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 140	(A) 240 (B)

Prevalence Index = B/A = 1.71

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: A-5

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5Y 3/1	100%	None				Silty sandy clay; fine; mucky	
6-16"	10YR 6/4	100%	5YR 3/4			C M	sand, ash	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- X Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 1/20"

Water Table Present? Yes X No ___ Depth (inches): 1"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

High water table 3" below surface; bent over vegetation.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.12.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: A-6

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): Terrace

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis stolonifera*	TR	FAC
2. *Calamagrostis canadensis*	10%	FAC
3. *Picea sitchensis*	100%	FACU
4. *Rumex acetosella*	5%	FAC
5.		
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16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 15	x 3 = 45
FACU species 105	x 4 = 420
UPL species _____	x 5 = _____
Column Totals: 120	(A) 465 (B)

Prevalence Index = B/A = 3.88

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: A-6

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	2.5Y 2.5/1	100%	None				loam with heavy organic content	
4-6"	10YR 7/3	100%	None					ash
6-12"	10YR 2/1	100%					blocky, silty loam	
ROCK								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Moist but not saturated following rain.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.12.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: B-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): terrace

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Alnus sinuata*	10%	FAC
2. *Angelica lucida*	25%	FACU
3. *Argentina anserina*	7%	FACW
4. *Calamagrostis canadensis*	40%	FAC
5. *Carex limosa*	10%	OBL
6. *Equisetum hyemale*	TR	FACW
7. *Geum macrophyllum*	15%	FAC
8. *Ranunculus repens*	5%	FAC
9. *Rumex acetosella*	TR	FACU
10. *Salix scouleriana*	35%	FAC
11. *Salix sitchensis*	35%	FAC
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 9-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

	Total % Cover of:	Multiply by:
OBL species	10	x 1 = 10
FACW species	7	x 2 = 14
FAC species	140	x 3 = 420
FACU species	25	x 4 = 100
UPL species	_____	x 5 = _____
Column Totals:	182	(A) 544 (B)

Prevalence Index = B/A = 2.99

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: B-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	10YR 3/2	100%	none				silty clay loam	
8-9"	10YR 3/2	100%	5YR 4/6	5%	C	M	silty clay loam	mostly gravel w/redox
9-11"	5Y 2.5/1	100%	none				sand	ash
11-13"	5Y 5/1	100%	5YR 4/6	2%	C	M	sand	ash
13-16"	5Y 3/1	100%	5YR 4/6	<1%	C	PL	sandy clay	transitions to gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- X Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- X Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil was moist due to recent rain. This wetland is on a floodplain terrace of the Buskin River and is likely inundated by river flows at higher high tide. Hydrology criteria were met using secondary indicators.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.12.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: B-2

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): slope

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis capillaris*	10%	FACU
2. *Alnus sinuata*	50%	FAC
3. *Angelica lucida*	40%	FACU
4. *Epilobium angustifolium*	15%	FACU
5. *Geum macrophyllum*	5%	FAC
6. *Heracleum lanatum*	15%	FACU
7. *Picea sitchensis*	30%	FACU
8. *Rubus spectabilis*	30%	FACU
9. *Salix scouleriana*	5%	FAC
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 9-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 60	x 3 = 180
FACU species 140	x 4 = 560
UPL species _____	x 5 = _____
Column Totals: 200 (A)	740 (B)

Prevalence Index = B/A = 3.70

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: B-2

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10YR 2/1	100%	none				clay loam w/gravel course & 4" (max.) cobbles	
3-16"	2.5YR 4/3	100%	10YR 5/3 inclusions				silty sand w/gravel, small and medium cobbles	
16-18"	10YR 5/3		with large mottles of lighter sand w/light staining					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: C-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): depression

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis capillaris*	20%	FACU
2. *Carex tenuiflora*	20%	OBL
3. *Eriophorum vaginatum*	40%	FACW
4. *Hordeum brachyantherum*	20%	FACW
5. *Plantago major*	5%	FAC
6. *Taraxacum officinale*	TR	FACU
7. *Trifolium pratense*	TR	FAC
8. *mown grass*	30%	
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species 20	x 1 = 20
FACW species 60	x 2 = 120
FAC species 5	x 3 = 15
FACU species 20	x 4 = 80
UPL species _____	x 5 = _____
Column Totals: 105 (A)	235 (B)

Prevalence Index = B/A = 2.24

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Soil and hydrology from plot with vegetation from entire wetland because vegetation was primarily mown grass lacking seed heads.

SOIL

Sampling Point: C-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6"	Gley 1 4 N	100%					clay loam; mostly coarse gravel	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- X Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0"	
Water Table Present?	Yes X	No ____	Depth (inches): 0"	
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"	**Wetland Hydrology Present?** Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Iron sheen on water

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: D-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): linear depression

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis capillaris*	TR	FACU
2. *Carex tenuiflora*	90%	OBL
3. *Juncus alpinus*	10%	OBL
4. *Taraxacum officinale*	5%	FACU
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:		Multiply by:	
OBL species	100	x 1 =	100
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	5	x 4 =	20
UPL species		x 5 =	
Column Totals:	105	(A)	120 (B)

Prevalence Index = B/A = 1.14

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Additional species present in the wetland (but not in the plot) include *Eriophroum chamissonis* (OBL), *Carex stipata* (OBL), *Juncus arcticus* (OBL), and *Juncus mertensianus* (OBL).

SOIL

Sampling Point: D-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10 YR 2/1	100%					silty gravel with silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Shallow silt layer over compacted gravel fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: D-2

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): _____

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Compacted gravel fill

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis capillaris*	25%	FACU
2. *Alnus sinuata* (mown)	5%	FAC
3. *Carex tenuiflora*	15%	OBL
4. *Picea sitchensis (mown)*	10%	FACU
5. *Potentilla gracilis*	TR	FAC
6. *Salix spp. (mown)*	7%	
7. *Taraxacum officinale*	25%	FACU
8. *moss*		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

	Total % Cover of:	Multiply by:
OBL species	15	x 1 = 15
FACW species		x 2 =
FAC species	5	x 3 = 15
FACU species	60	x 4 = 240
UPL species		x 5 =
Column Totals:	80 (A)	270 (B)

Prevalence Index = B/A = 3.38

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: D-2

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	10 YR 2/2	20% - the remaining 80% is gravel					silty gravel	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks:

Compacted gravel fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: E-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): linear depression

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Achillea millefolium*	TR	FACU
2. *Agrostis capillaris*	10%	FACU
3. *Angelica lucida*	TR	FACU
4. *Calamagrostis canadensis*	75%	FAC
5. *Epilobium angustifolium*	10%	FACU
6. *moss*	5%	
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 75	x 3 = 225
FACU species 20	x 4 = 80
UPL species _____	x 5 = _____
Column Totals: 95 (A)	305 (B)

Prevalence Index = B/A = 3.21

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: E-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	Gley 1 4/10Y	100%					clay	few, faint
8-12"	Gley 1 4/10Y	100%					clay and gravel	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- X Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 4-6"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: E-2

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): _____

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Achillea millefolium*	25%	FACU
2. *Agrostis capillaris*	40%	FACU
3. *Angelica lucida*	5%	FACU
4. *Calamagrostis canadensis*	TR	FAC
5. *Epilobium angustifolium*	15%	FACU
6. *Solidago canadensis*	7%	FACU
7. *Trifolium pratense*	5%	FAC
8. *moss*	100%	IS?
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 5	x 3 = 15
FACU species 87	x 4 = 348
UPL species _____	x 5 = _____
Column Totals: 92 (A)	363 (B)

Prevalence Index = B/A = 3.95

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: E-2

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	Gley 1 4/10Y	100%	none				large gravel with clay	
3-16"	Gravel fill layer							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No __X__

Remarks:

Gley is color of parent gravel material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No __X__ Depth (inches): _____

Water Table Present? Yes _____ No __X__ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No __X__ Depth (inches): _____

Wetland Hydrology Present? Yes ____ No __X__

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: F-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.): depression

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Non-wetland areas are dominated by rock and shale piles with little vegetation (moss and alder only) Significant disturbance adjacent to wetland is evident.

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis capillaris*	TR	FACU
2. *Alnus sinuata*	15%	FAC
3. *Calamagrostis canadensis*	20%	FAC
4. *Carex lenticularis var. lipocarpa*	25%	OBL
5. *Carex sitchensis*	5%	OBL
6. *Eleocharis ovata*	30%	OBL
7. *Eleocharis palustris*	30%	OBL
8. *Equisetum hyemale*	10%	FACW
9. *Juncus arcticus*	TR	OBL
10. *Salix sitchensis*	10%	FAC
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 1-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

	Total % Cover of:	Multiply by:
OBL species	90	x 1 = 90
FACW species	10	x 2 = 20
FAC species	45	x 3 = 135
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	145 (A)	245 (B)

Prevalence Index = B/A = 1.69

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: F-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	Gley 1 5/10Y	100%	none				silty clay	
>4"							coarse gravels	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- X Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- X Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0"

Water Table Present? Yes X No _____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Kodiak Airport / Coast Guard Reservation / Buskin R. State Recreation Area Borough/City: Kodiak Island Sampling Date: 9.13.07

Applicant/Owner: Alaska Department of Transportation / Federal Aviation Administration Sampling Point: G-1

Investigator(s): M. Raad, T Johnson, R. Ruggiero Landform (hillside, terrace, hummocks, etc.):linear depression

Local relief (concave, convex, none): none Slope (%): _____

Subregion: Southcentral Alaska Lat: _____ Long: _____ Datum: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Non-wetland areas are dominated by gravel fill slope with moss, *Picea sitchensis*, and *Salix spp.*

VEGETATION

Species (Use scientific names. List all species in plot.)	Absolute % Cover	Indicator Status
1. *Agrostis capillaris*	TR	FACU
2. *Aruncus dioicus*	5%	UPL
3. *Carex lenticularis var. lipocarpa*	60%	OBL
4. *Deschampsia cespitosa*	10%	OBL
5. *Equisetum hyemale*	15%	FACW
6. *Juncus alpinus*	15%	OBL
7. *Salix sitchensis*	30%	FAC
8. *Salix scouleriana*	15%	FAC
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

Total Cover: 100%

Plot size 9-meter radius % Bare Ground 0%

% Cover of Wetland Bryophytes _____ Total Cover of Bryophytes _____

Prevalence Index:

	Total % Cover of:	Multiply by:
OBL species	85	x 1 = 85
FACW species	15	x 2 = 30
FAC species	45	x 3 = 135
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	145	(A) 250 (B)

Prevalence Index = B/A = 1.72

Other Indicators of Hydrophytic Vegetation: (Record supporting data in Remarks or on a separate sheet.)

___ Wetland Cryptogams (record species and cover at left)

___ Morphological Adaptations

___ Problematic Hydrophytic Vegetation (Explain)

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: G-1

Profile Description: (Describe to the depth needed to document the indicator.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5"	10 YR 2/2	100%	none				sandy clay loam	coarse gravels at 5"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present.

[4]Give details of color change in Remarks.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Mat or Crust of Algae or Marl (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D: Ground Level Color Photographs

Plot A-1

Plot A-1 Location

Plot A-2

Plot A-2 Location

Plot A-3

Plot A-3 Location

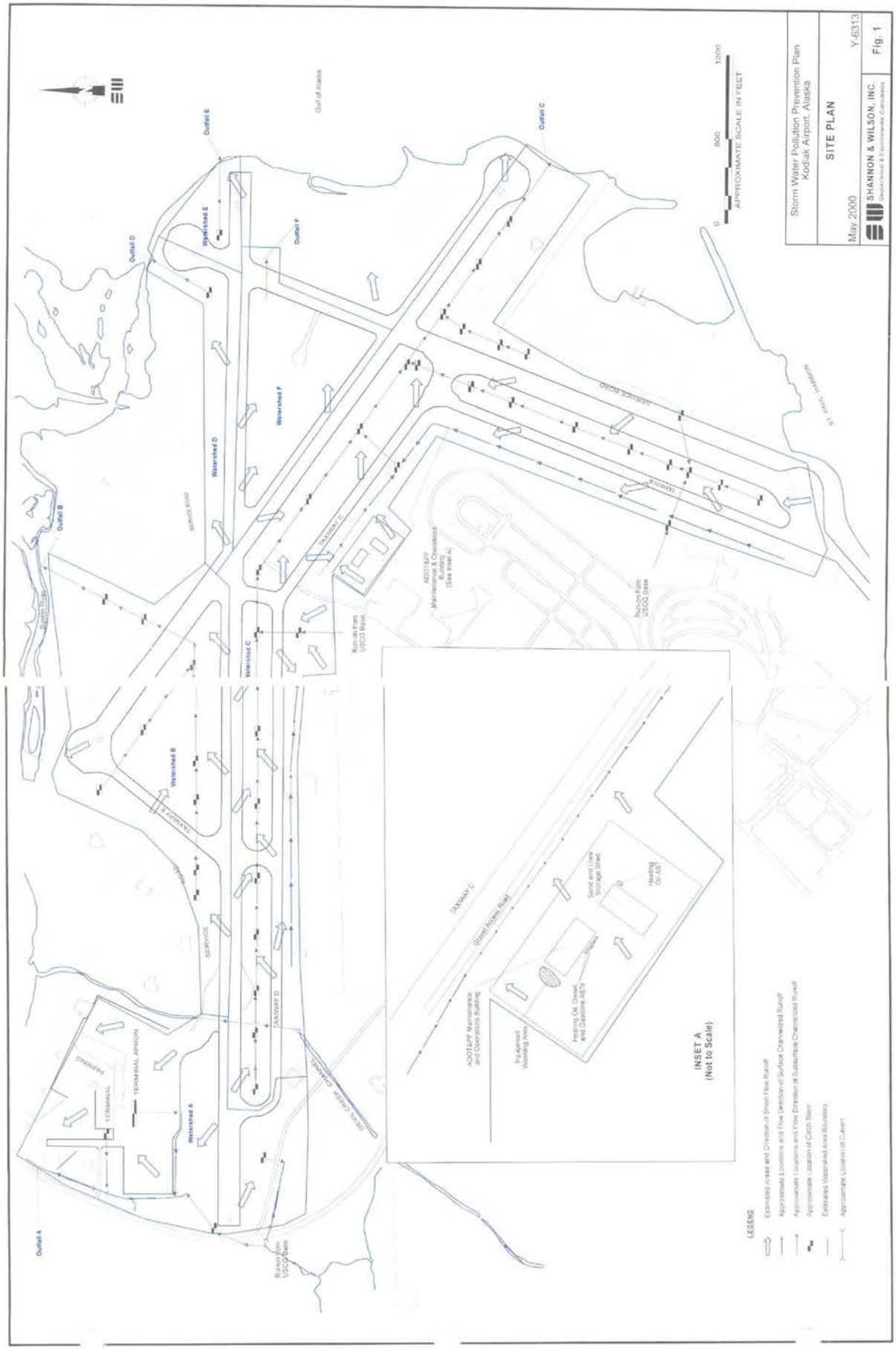
	
Plot A-4	**Plot A-4 Location**
	
Plot A-5	**Plot A-5 Location (A-6 on terrace in background)**

	
Plot B-1	**Plot B-1 Location**
	
Plot B-2	**Plot B-2 Location**
	
Plot C-1	

	
Plot D-1	**Plot D-1 Location**
	
Plot D-2	**Plot D-2 Vegetation**
	
Plot E-1	**Wetland E Vegetation Line**

	
Plot F-1	**Plot F-1 Location**
	
	Plot G-1 Location

Appendix E: Stormwater Drainage System


Storm Water Pollution Prevention Plan
Kodiak Airport, Alaska
SITE PLAN
May 2000
Y-6313
SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants
Fig. 1
APPROXIMATE SCALE IN FEET
0
600
1200
Outfall A
Outfall B
Outfall C
Outfall D
Outfall E
Outfall F
Watershed A
Watershed B
Watershed C
Watershed D
Watershed E
Watershed F
Gulf of Alaska
TERMINAL APRON
TERMINAL
RAMP
SERVICE ROAD
TAXIWAY A
TAXIWAY B
TAXIWAY C
TAXIWAY D
RUNWAY 4-22
RUNWAY 18-36
DEVIL CANYON CHANNEL
Runon from USCG Base
ADOT&PF Maintenance & Operations Building (Site Inset A)
INSET A
(Not to Scale)
Gravel Access Road
Equipment Washing Area
Heating Oil Diesel and Gasoline ASTs
Sand and Lime Storage Shed
Heating Oil AST
LEGEND
Estimated Areas and Direction of Sheet Flow Runoff
Approximate Locations and Flow Direction of Surface Channelized Runoff
Approximate Locations and Flow Direction of Subsurface Channelized Runoff
Approximate Location of Catch Basin
Estimated Watershed Area Boundary
Approximate Location of Culvert

Appendix F: Functional Assessment

1 Wetland Functions

A wetland delineation report (May 2008) was prepared to support the Kodiak Airport Environmental Impact Statement (EIS), and the U.S. Army Corps of Engineers concurred with this delineation on August 4, 2008. Wetlands located at the Airport study area are illustrated in **Figure 1-1**. Wetland functions were assessed as part of the wetland delineation effort using a number of established hydrogeomorphic (HGM)-based methods. The selected methods include:

- *Hydrogeomorphic (HGM) Assessment Guidebook for Tidal Wetlands of the Oregon Coast, Part 1: Rapid Assessment Method;* [1]
- *Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and Southcentral Alaska Using the HGM Approach;*[2] *and*
- *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites. Volume 1A: Assessment Methods.* [3]

Rationale for the application of these different HGM assessment methods is included within the description of each specific wetland.

The assessment methodologies were modified as necessary to better match the conditions at the Airport and to take full advantage of data being collected by the EIS consulting team for other resource-specific field investigations. The technical memoranda describing these efforts were used to support the wetland functional assessments as well as personal communication with specific project staff. References include:

- *Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation);*[4]
- *Kodiak Airport EIS Water Resources Technical Memorandum;*[5] *and*
- Spencer Martin, principal ecologist, SWCA.[6]

Functional assessment forms are included in **Appendix A** of this memorandum. All of the referenced methods use a similar numeric scoring system, but interpretation of the

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[1] Adamus, P.R., *Hydrogeomorphic (HGM) Assessment Guidebook for Tidal Wetlands of the Oregon Coast, Part 1: Rapid Assessment Method.* Report to Coos Watershed Association, US Environmental Protection Agency Region 10, and Oregon Department of State Lands, Charleston, Oregon, 2006.

[2] Powell, J.E., D.V. D'Amore, R. Thompson, P. Huberth, B. Bigelow, M.T. Walter, and T. Brock. *Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and South central Alaska Using the HGM Approach.* State of Alaska Department of Environmental Conservation. June 2003.

[3] Adamus, P.R. and D. Fields. *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites. Volume 1A: Assessment Methods.* Oregon Division of State Lands, Salem, Oregon. 2001.

[4] SWCA Environmental Consultants, *Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation)*

[5] Vigil-Agrimis, Inc. *Kodiak Airport EIS Water Resources Technical Memorandum, June 2008*

[6] Spencer Martin, principal ecologist, SWCA Environmental Consultants, Personal communication with Maureen Raad, Vigil-Agrimis, Inc. September 23, 2008

scores has been made more intuitive by cross-reference to a qualitative rating, as illustrated in **Table 1-1**. It is important to note that comparing the scores of wetlands in different HGM classes may not accurately portray the value of the provided functions.

TABLE 1-1
NUMERIC SCORE – QUALITATIVE RANKING EQUIVALENTS

Numeric Score Range	Qualitative Ranking
0 – 0.1	Low
0.2 – 0.3	Moderate-Low
0.4 – 0.5	Moderate
0.6 – 0.7	Moderate-High
0.8 – 0.9	High
1	Very High

1.1 Tidal Fringe Wetlands

Methods described in the HGM Assessment Guidebook for the Oregon Coast were used to assess the functions of tidally-influenced Wetland A because no tidal fringe wetland assessment methodology for an applicable Alaska-region was available. Data Forms A1, B1, and B2 were filled out as part of the functional assessment. Form C, which provides a valuation of the assessed functions, is organized into function categories similar to those in the other two methodologies used to assess wetland functions at the Airport and was therefore used to populate Table 1.1-1. Questions on the biological functions provided by the wetlands were answered using data collected for the EIS and described in *Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation)*[7] and in conversation with Spencer Martin of SWCAI.[8] These data included information gathered from NMFS, USFWS, ADNR, ADEC, ADFG, and the local Audubon Society as well as direct field observations.

Because the vegetation in this wetland was of a uniform plan community no transect vegetation data was collected. Vegetation data collected for the wetland delineation report was used to categorize the wetland vegetation.

Alaska regularly experiences earthquakes and is vulnerable to tsunami resulting from deep ocean quakes. In 1964 an earthquake generated tsunami ravaged the City of Kodiak as well as smaller coastal communities on the Island. For this reason, the *National Guidebook for the Application of Hydrogeomorphic Assessment to Tidal Fringe*

[7] SWCA Environmental Consultants, *Freshwater and Marine Ecology Technical report for Kodiak Airport Environmental Impact statement, Kodiak, Alaska (in preparation)*
[8] Spencer Martin, principal ecologist, SWCA Environmental Consultants, Personal communication with Maureen Raad, Vigil-Agrimis, Inc. September 23, 2008

Wetlands[9] was reviewed so a judgmental assessment of tidal surge attenuation function could be included. The variables described in this document were quantified and used to generate a qualitative assessment of function in the absence of local reference wetlands.

Wetland A is one of the largest wetlands in the study area. As part of the Buskin River system it provides a source of food and refuge for a number of anadromous fish and other species. The functional ratings for the wetlands within the project area are provided in **Table 1.1-1.**

TABLE 1.1-1
FUNCTIONS PROVIDED BY TIDAL FRINGE WETLANDS

Wetland ID	**A**
Size (acres)	9.6
Functions	**Scores**
Hydrologic Control	
Tidal Surge Attenuation	ML
Water Quality	
Maintaining Element Cycling Rates & Pollutant Processing & Stabilizing Sediment	MH
Primary Production & Exporting Above Ground Production	H
Habitat	
Maintaining Habitat for Resident Fish & Visiting Marine Fish	MH
Maintaining Anadromous Fish	H
Maintaining Invertebrate Habitat	ML
Maintaining Habitat for Ducks, Geese & Shorebirds	ML
Maintaining Habitat for Native Land Birds, Small Mammals, Their Predators, and Nekton-Feeding Birds	ML
Maintaining Natural Botanical Conditions	M

Note: VH = Very High, H = High, MH = Moderate-High, M = Moderate, ML = Moderate-Low, L=Low

A barrier bar separates the tidally influenced wetland from St. Paul Harbor. This barrier bar provides most of the tidal surge attenuation function by dissipating wave energy. The wetland does provide moderate-low tidal surge attenuation function because of the roughness of the vegetation and its ability to store some water during a storm surge or tsunami event.

Habitat support functions for salmonids and other fish were high to moderate-high with

[9] Shafer, D.J and D. Yozzo. *National Guidebook for the Application of Hydrogeomorphic Assessment to Tidal Fringe Wetlands.* Technical Report WRP-DE-16. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Missouri, December 1998

lower scores for terrestrial mammals and birds. Brown bear primarily use the Buskin River upstream of the tidally influenced portion.

1.2 Riverine/Slope Proximal Wetlands

The riverine and slope river proximal assessment methodology was used because it was an appropriate regionally specific methodology for assessing the functions of the Buskin River and Wetland B[10]. As part of the EIS data collection, cross sections were established at 52 locations along the Buskin River. Field measurements and observations were made at each location and were recorded by a surveyor. In addition, sediment samples were taken at five locations and sent to a lab for a sieve analysis. This data was used in lieu of the cross section and pebble count data collection protocols described in the methodology. The 10-year and 100-year floodplains were also modeled using HEC-RAS, in part to inform our understanding of floodplain connectivity. The functional ratings for the wetlands within the project area and the Buskin River are provided in **Table 1.2-1,** based on the information included in the WetB.DataForm.

TABLE 1.2-1
FUNCTIONS PROVIDED BY RIVERINE/SLOPE PROXIMAL WETLANDS

Wetland ID	**B**	**Buskin River**
Size (acres)	0.15	19.4
Functions	**Scores**	
Hydrologic Control		
Channel Meander Belt Integrity	MH	
Dynamic Floodwater Retention	MH	
Water Quality		
Nutrient Spiraling & Organic Carbon Export	MH	
Particulate Retention	M	
Removal of Imported Elements & Compounds	M	
Habitat		
Maintenance of In-Channel Aquatic Biota	MH	
Presence of Coarse Wood Structure	M	
Maintenance of Riparian Vegetation	MH	
Maintenance of Connectivity & Interspersion	MH	

Note: VH = Very High, H = High, MH = Moderate-High, M = Moderate, ML = Moderate-Low, L=Low

[10] Powell, J.E., D.V. D'Amore, R. Thompson, P. Huberth, B. Bigelow, M.T. Walter, and T. Brock. *Wetland Functional Assessment Guidebook, Operational Draft Guidebook for Assessing the Functions for Riverine and Slope River Proximal Wetlands in Coastal Southeast and South central Alaska Using the HGM Approach.* State of Alaska Department of Environmental Conservation. June 2003

Despite human alterations to the terraces adjacent to the Buskin River the floodplain and meander belt functions scored moderate-high, indicating that floodplain connectivity is still intact and the channel is not too incised.

Water quality functions were moderate to moderate-high. These functions are often lower for riverine wetlands that typically provide few opportunities for water to slow down and sediment to come out of suspension, thereby removing elements and compounds from the water.

The river supports several salmon runs so it is not surprising that this wetland scored moderately-high in the habitat category. The presence of coarse wood structure was only scored as moderate, reflecting a relative paucity of forest on Kodiak Island although forest cover is becoming more established as permafrost retreats.

1.3 Small Depressional and Riverine Wetlands

The judgmental method outlined in the Guidebook for HGM-based Assessment of Oregon Wetland and Riparian Sites was selected because it provided a quick evaluation method for the small degraded wetlands on the airport property. No modifications were made to this method. These wetlands do not support either resident or anadromous fish populations so these functions were not evaluated. The functional ratings for the wetlands within the project area are provided in **Table 1.3-1,** based on the information included in the applicable, attached dataforms.

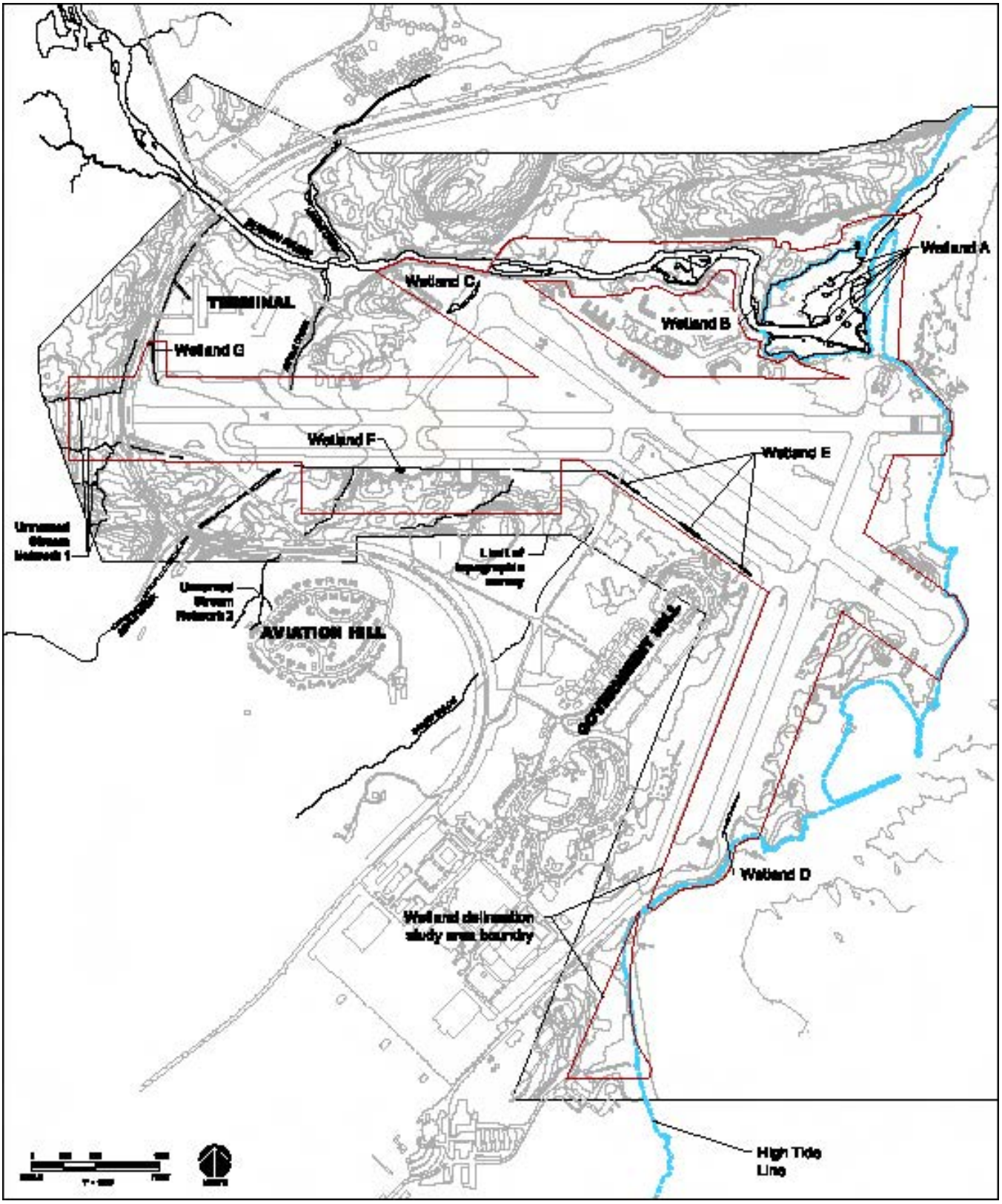
The small size of these wetlands contributed to their relatively low function scores. The depressional wetlands – C, D, and F – had slightly higher scores for water storage and delay and sediment stabilization and phosphorus retention. Wetland F and G has more diverse vegetation with areas of standing water and so had slightly higher invertebrate and amphibian habitat support scores.

TABLE 1.3-1
FUNCTIONS PROVIDED BY DEPRESSIONAL AND RIVERINE WETLANDS

Wetland ID	**C**	**D**	**E**	**F**	**G**
HGM Classification	D,O	D,O	R, FT	D,O	R, FT
Size (acres)	0.25	0.11	0.22	0.05	0.09
Functions	**Scores**				
Hydrologic Control					
Water Storage & Delay	M	M	ML	M	ML
Water Quality					
Sediment Stabilization & Phosphorous Retention	M	M	ML	M	ML
Nitrogen Removal	ML	ML	ML	M	ML
Primary Production	ML	ML	ML	ML	M
Thermoregulation	ML	ML	ML	ML	M
Habitat					
Resident Fish Habitat Support	-	-	-	-	-
Anadromous Fish Habitat Support	-	-	-	-	-
Invertebrate Habitat Support	ML	ML	ML	M	M
Amphibian & Turtle Habitat	ML	ML	ML	M	ML
Breeding Waterbird Support	-	-	-	-	-
Wintering & Migratory Waterbird Support	-	-	-	-	-
Songbird Habitat Support	ML	ML	ML	ML	ML
Support of Characteristic Vegetation	ML	ML	ML	ML	ML

Note: VH = Very High, H = High, MH = Moderate-High, M = Moderate, ML = Moderate-Low, L=Low
HGM Classification: D = Depressional, R = Riverine
Subclass: O = Outflow, FT = Flow-through

FIGURE 1-1
AIRPORT VICINITY WETLANDS AND OTHER WATERS



APPENDIX A

Wetland Site Name: KODIAK AIRPORT EIS WETland A Date: 9/11/2007 Time Begin:_____ Time End: _____
Assessor: Maureen Raad Total Marsh Transect Length (combined): _____m
Estimated Position of the assessed unit in the estuary:
near ocean (lower one-third): ✓+ mid: _____ near major head-of-tide (upper one-third): _____
Estimated HGM areas in the assessed unit:
Marine-sourced **High** Marsh: 70 % Marine-sourced **Low** Marsh: 30 % **River-sourced** Tidal Wetland: 0 %

code	indicator	scale/score	guidance
1. BuffAlt	**Relative buffer between the wetland and upland areas.** Calculate: A * (B + C). [For example, for A, B, C below, calculate 2 x (1 + 3) = 8.] Screen the resulting calculation with the scale on the right [ex: 8 = 0.3], then enter the score in the box. Optionally, also enter an estimate of certainty (0 to 1). A) Within 100 ft of the wetland's edge with adjoining upland, the % of the upland that contains pavement, buildings, or other bare substrate: **% upland as described** / **scale** <5 % / **1** 5-14 % / **2** 15 – 24 % / **(3)** 25-49 % / **4** >50 % / **5** wetland occupies nearly all of an island, and none of the island is developed / **0** B) Within 100 ft of the wetland's edge, the predominant elevation of the portion of the upland that is most-disturbed (paved, landscaped, overgrazed, or bare): **predominant elevation** / **scale** < 20 ft higher than wetland / **(1)** 20-50 ft higher / **2** >50 ft higher / **3** C) Within 100 ft of the wetland's edge, the substrate predominating in the portion of the upland that is most-disturbed (paved, landscaped, overgrazed, or bare): **predominant substrate** / **scale** loam, silt, clay / **1** fine, sandy soil / **2** coarse sand (minimal organin layer), fill, pavement, or rock / **(3)** Screen the resulting calculation with the scale on the right, then in the box enter the score and optionally an estimate of certainty (0 to 1).	0 = 0.01 1-2 = 0.1 3-6 = 0.2 7-9 = 0.3 10-12 = 0.4 13-15 = 0.5 16-18 = 0.6 19-21 = 0.7 22-24 = 0.8 25-27 = 0.9 >27 = 1.0 **score #1:** 0.4 **certainty #1:**	*Within 100 ft* = the percent within the entire area that is upland and within 100 ft. of the wetland-upland edge. Do not include the tidal wetland itself, but non-tidal wetlands may be included as part of that zone. Measure the 100 ft horizontally from the wetland's upper limit of annual tidal flooding (highest tide). Extend the 100 ft limit to 300 ft if a perennial freshwater tributary flows through the wetland, i.e., 100 ft on either side of the tributary channel, up to 300 ft away. Used for: RA.* * see page 23 or Appendix A for abbreviations

A2- Not completed - wetland has no internal channels.

code	indicator	scale/score	guidance
2. ChemIn	Maximum risk of the wetland being exposed to **chemical pollutants** (excluding **nutrients**). Calculate: **T * (L + E).** [For example, 0 x (1 + 1) = 0] where: **T** *Toxicity*: no pollutant sources likely in nearby runoff, groundwater, or surface water; no history of recent spills reaching the wetland = **0**; some pollutants = **(1)** **L** Maximum *Load* (of contaminants): diffuse (distant source), or infrequent (severe storms only) = **1**; concentrated (nearby source) or frequent = **(2)** **E** Maximum *Extent* (of contaminants): limited (only a small % of the wetland is likely to be exposed to the chemical) = **(1)**; most of wetland could be exposed = **2** Compare the result with the scale at the right to determine the score.	0 = 0.01 2 = 0.33 3 = 0.66 4 = 1.00 **score #2:** 0.66 **certainty #2:**	*Toxicity* = pollutants include substances potentially harmful to plants or animals and present well above any natural background level. *Load* = runoff load of contaminants will depend partly on size, slope, and soil type of the contributing area; consider annual maximum for a normal year. *Extent* = "limited" would apply if surface water travels only in a single internal channel, or if the only contaminant source is at a localized spot along the upland edge. "Certainty" should normally be scored very low for this indicator. If measured data are available, you may use it to inform components (T) and (L). Used for: RA, Inv, Afish, Mfish, Rfish, [NFW, Sbird, LbirdM].
3. NutrIn	Maximum risk of **nutrient overload** in the wetland. Calculate: S * (L + E) For example, 1 x (1 + 2) = 3 where: **S** *Source Type*: no abnormal sources = **(0)**; minor potential or known source of nitrogen or phosphorus = **1**; major potential or known source of nitrogen or phosphorus = **2** **L** Maximum *Load* (of nutrients): diffuse or diluted (distant source), or infrequent = **(1)**; concentrated (nearby source) or frequent = **2** **E** Maximum *Extent*: only a small % of the wetland is likely to receive inputs due to its relative elevation & other factors = **(1)**; not localized = **2** Compare the result with the scale at the right to determine the score.	0 = 0.01 2 = 0.33 3 = 0.66 4 = 1.00 **score #3:** 0.01 **certainty #3:**	*Minor* source type = widely-scattered houses, lawns, low-density grazing, parking lots, extensive stands of alder, recently burned or logged areas, and/or occasional large boat traffic. *Major* source type = neighborhoods (not on sewer lines), extensive concentrated grazing, waste treatment plant effluent, many malfunctioning septic systems, and/or boatyards, harbors. *Load*, *Extent*: see above. If measured data are available, you may use it to inform components (S) and (E). Used for: RA, AProd, Dux, [WQ, Xpt, Inv, Afish, Mfish, Rfish, NFW, Sbird, LbirdM].

<table>
<tr><th>code</th><th>indicator</th><th>scale/score</th><th>guidance</th></tr>
<tr><td>4.
SedShed</td><td>Incoming fine-sediment overload.
As a result of human activities outside the wetland, sediment loads reaching the wetland are currently (select one):

<table>
<tr><th>sediment loads</th><th>score</th></tr>
<tr><td>mostly normal for the wetland's subclass and location in the estuary</td><td>0.01</td></tr>
<tr><td>somewhat above normal for the wetland's subclass and location in the estuary, due to accelerated erosion upslope, upriver, or alongshore</td><td>0.50</td></tr>
<tr><td>much above normal for the wetland's subclass and location in the estuary, due to accelerated erosion upslope, upriver, or alongshore</td><td>1.00</td></tr>
</table></td><td>score #4:
0.01

certainty #4:</td><td>Ignore the wetland's ability to trap whatever sediment arrives—consider only its exposure to elevated sediment loads.

Potential sources include: eroding banks, logged or burned areas, mining (especially gravel, placer), roads, frequent dredging, livestock, ATVs. Consider proximity, extent, slope, substrate type, and number of years to recover.

"Normal" for a wetland near the estuary mouth may be a greater load than for a wetland near head-of-tide, because load increases downstream even in pristine estuaries.

Used for: RA, Inv, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].</td></tr>
<tr><td>5.
SoilX</td><td>Onsite soil disturbance.
How much of the assessment unit (only the part that is still wetland) has been affected by ongoing or past erosion/ compaction caused directly by human activities.

<table>
<tr><th></th><th>none</th><th>1- 10%</th><th>10-50%</th><th>>50%</th></tr>
<tr><td>ongoing</td><td>0</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>historical but still apparent</td><td>0</td><td>1</td><td>2</td><td>3</td></tr>
</table>
Select one number from each row. Then sum the two chosen numbers and apply the scale on the right to derive the score.</td><td>0 = 0.01
1 = 0.1
2 = 0.2
3 = 0.3
4 = 0.4
5 = 0.6
6 = 0.8
7 = 1.0

score #5:
0.2

certainty #5:</td><td>Potential disturbances within the wetland include: livestock, ATVs, restoration activities, subsidence associated with diking, ditches, fills, log storage. Consider extent and severity.

Infer past log storage from historical aerial photographs, local contacts, presence nearby of old pilings, and partially-buried cut logs. Infer livestock from presence of fences, or local knowledge.

Used for: RA, AProd, WQ, [Xpt, Inv, Afish, Mfish, Rfish, NFW, Sbird, LbirdM].</td></tr>
</table>

code	indicator	score	guidance
6. DikeDry	Degree the area that is still wetland (and including its internal channels) becomes **drier** (i.e., muted tidal flooding) as a result of ditches or the installation of dikes, tidegates, culverts, and other artificial constrictions. no such alterations, and **no changes** observed — **0.01** flooding from tide or runoff occurs less often as a result of the alterations—nonetheless, nearly all areas within the wetland that previously were flooded by daily tides **continue to flood daily** — **0.33** some areas that previously were flooded by daily tides or upland runoff **no longer flood daily**, but are still tidal wetland; during monthly low tides, there is much less water in the wetland than previously — **0.66** daily **tidal circulation has been eliminated** from all but a small part of the wetland; severe reduction in frequency, duration, and depth of daily and monthly high/low tide — **1.00** **Note:** For many diked wetlands, the appropriate score will be 0.66.	**score #6:** 0.01 **certainty #6:**	Where historical data are lacking, consider "drier" relative to nearby unaltered wetlands of about the same elevation & size. Wetlands receiving little upland runoff or groundwater seepage are especially vulnerable to this condition when they are diked. Mainly include constrictions within or along the upland or water edge of the wetland. In rare instances decreased onsite flooding may be attributed to presence of upriver dams, water diversions, or dredging (deepening) of estuary mouths. Ignore drying due to geologic uplift or to sediment-related increases in elevation of marsh surface, but include drying if due to sediment blockage of surface water inputs. As time allows, use procedures described by Brophy (2005) for locating tidegates. Used for: RA.
7. DikeWet	Degree this wetland and/or its channels becomes **wetter** (more ponding) as a result of installation of dikes, tidegates, culverts, ditches, and other artificial constrictions or excavations, including substrate compaction and subsidence associated with these. no such alterations, and **no changes** observed — **0.01** some areas within the wetland now flood more often, longer, or more extensively as a result of alterations, **but only at monthly high (spring) tide** and/or during heavy precipitation — **0.33** some areas within the wetland now flood more often, longer, or more extensively **and this is noticeable each day**; and/or upland runoff is noticeably impounded within the wetland at various times as a result of the alterations — **0.66** much of the site remains **flooded long after daily high tide**; and/or major increase in flooding as a result of sediment subsidence following diking — **1.00** **Note:** For many diked wetlands, the appropriate score will be 0.66.	**score #7:** 0.01 **certainty #7:**	Do not include dike breaching or removal that made the site wetter (such as that evidenced by dead trees). Where historical data are lacking, consider "wetter" relative to nearby unaltered wetlands of about the same elevation. Diked wetlands are especially vulnerable to this condition if they have perennial tributaries, direct stormwater inputs, or seeps/wetlands along their upland edge. In rare instances increased onsite flooding may be attributed to increased runoff from pavement, inputs from offsite ditches, or recent clearcutting in the watershed. As time allows, use procedures described by Brophy (2005) for locating tidegates. Used for: RA.

code	indicator	score	guidance
8. FootVis	Extent and frequency of **wetland visitation**. Calculate: A + (B*2) + (C*3). [For example, 10 + (20x2) + (70x3) = 260] where: 10 + 160 + 30 = 200 10 (A) % of wetland & upland* visited **only rarely** (<10 days /yr) by people **on foot** 80 (B) % of wetland & upland* with intermediate visitation frequency 10 (C) % of wetland & upland* visited **daily** or almost so (>360 days/yr) * includes upland within 100 ft. **the resulting number** / **score**: <110 (infrequent & localized visitation) **0.01** 110-139 **0.33** 140-199 **0.66** 200+ (frequent & extensive visitation) **1.00**	**score #8:** 1.00 **certainty #8:**	A, B, and C must sum to 100%. Assume an average visitor "casts a disturbance shadow" of radius 100 ft. Infer greater visitation frequency if closer to roads & buildings (especially population centers), public land, mostly high marsh, and/or signs of use, e.g., foot trails. Used for: RA, NFW, Dux, Sbird.
9. Boats	How frequent and close is **boat traffic** (all types)? **<100 ft away** / **100-1000 ft away** / **>1000 ft away**: **seldom (<2x/day)** 0.6 / 0.4 / 0.01 **frequent** 0.8 / 0.6 / 0.2 **nearly constant** 1.0 / 0.8 / 0.4 Select the largest number that is applicable and enter it in the Score box.	**score #9:** 0.01 **certainty #9:**	Used for: RA, NFW.
10. HomeDis	Proximity (ft) to the **nearest inhabited structure**. **proximity** / **score**: <200' **1.00** 200'-999' **0.75** 1000'-1999' **0.50** ✓ 2000'-5000' **0.25** >5000' **0.01**	**score #10:** 0.05 **certainty #10:**	Estimate the distance from the wetland-upland edge closest to the structure. The structure must be: (a) inhabited for at least 2 months per year, *and* (b) not continuously separated from wetland by water wider than 10 ft., e.g., not on an opposite shore. Aerial photographs or topo maps are useful. Used for: RA, LbirdM.

<table>
<tr><th>code</th><th>indicator</th><th>score</th><th>guidance</th></tr>
<tr><td>11.
RoadX</td><td>Proximity (ft) to the nearest paved area:

<table>
<tr><th></th><th><10 ft</th><th>10-100'</th><th>100-1000'</th></tr>
<tr><td>primary roads</td><td>1.0</td><td>0.6</td><td>0.2</td></tr>
<tr><td>secondary roads</td><td>0.6</td><td>0.3</td><td>0.01</td></tr>
</table>

Enter the maximum appropriate number directly into the score box to the right.</td><td>score #11:
0.3

certainty #11:</td><td>Consider parking lots (>20 vehicle capacity) to be primary roads. Primary roads usually have >1 vehicles/minute during the daytime. If a primary road borders only a tiny fraction of a wetland's upland edge, treat it as a secondary road.

Used for: RA, LbirdM.</td></tr>
<tr><td>12.
Invas</td><td>Presence or potential for invasive exotic invertebrates.

<table>
<tr><th></th><th>score</th></tr>
<tr><td>no invasive exotic invertebrates have been reported from this estuary (see guidance at far right), and there are no oyster cultivation facilities or large-ship traffic routes in similar parts of the same estuary</td><td>0.01</td></tr>
<tr><td>no invasive exotic invertebrates have been reported from this estuary (see column at far right), but there are oyster cultivation facilities and/or large ships traffic in the estuary</td><td>0.50</td></tr>
<tr><td>populations of invasive exotic invertebrates are known to have become established in this estuary</td><td>1.00</td></tr>
</table>
</td><td>score #12:

certainty #12:</td><td>Green crabs or other invasive invertebrate species have been documented in Tillamook, Netarts, Salmon, Siletz, Yaquina, Alsea, Umpqua, Coos, and Coquille estuaries. Oyster facilities are present in some of these plus in the Nehalem and Siuslaw estuaries.

Large ship traffic = deep-draft vessels, especially those that discharge foreign ballast water.

(NO DATA)

Used for: RA, Inv, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].</td></tr>
</table>

code	indicator	scale/score	guidance
13. Instabil	Possible **instability** of the wetland. Calculate the following using the numeric values below: **A + B + C + D + E = scale** Then use the scale to the right and enter a score in the box.	3 = 0.01 4 = 0.1 5 = 0.2 6 = 0.3 7 = 0.4 8 = 0.5 9 = 0.6 10 = 0.7 11 = 0.8 12 = 0.9 >12 = 1.0	

A) Living trees or shrubs > 10 ft. tall and flooded by tide at least once per year:

description	value
many	1
few	2
none	(3)

B) Percent of wetland that is high marsh (not flooded daily during most of the month, but still flooded occasionally by tide):

description	value
>50%	(0)
10-50%	1
1-10%	2
<1%	3

marsh seems to be new following 1964 tsunami.

C) Change in area of wetland and adjoining tideflat as indicated from historical data, maps, or images:

description	value
increase from sedimentation, or no noticeable change, or no data	(1)
loss of marsh area from erosion or windblown sand (*not* from filling, diking, drainage)	3

(C) Do not include direct losses from filling or diking, or increases due to restoration – include only those from sedimentation or erosion. If area loss can be documented at any time since 1850, assign a "0" regardless of possible subsequent increased area. Be careful when comparing historical maps or aerial photographs, as apparent changes may actually be due to differences in the daily or monthly tidal cycle when the image was recorded.

D) Tidal circulation:

description	value
no evidence tidal flooding restricted during past 100 years	(0)
full daily tidal flooding resumed *more than* 10 years ago	1
full daily tidal flooding resumed *less than* 10 years ago	2
partial tidal flooding resumed *more than* 10 years ago	3
partial tidal flooding resumed *less than* 10 years ago	4

(D) Restoration may have been intentional or from natural erosion of dikes. Partial tidal flooding includes marshes with "muted" tidal amplitude due to culvert restrictions or modified tidegates. Presence of dike remnants does not always mean tidal flooding is partial.

E) Predominant substrate:

description	value
loam, silt, clay	1
sandy soil	(2)
sand dunes, fill, dredged material, rock	3

score #13: 0.03

certainty #13:

Used for: RA, WQ.

TIDAL SURGE ATTENUATION

Vrough Table 6 Earth 0.02 Minor 0.005 Table 7 Tall Grass 0.035 n = 0.06

Vdist 110.5 ft
756 ft
994 ft

AVE = 620 ft.

↓

Scaling option "before"

TSA = 620 + 0.06 / 2 = 310.03

Compained to the Russian and American River estuaries this is quite low.

The wetland is also behind a barrier bar that will absorb most of the wave energy.

code	indicator	scale/score	guidance
25. Flood	Imagine the wetland under each tidal condition listed below. What % of the wetland's area (including its internal tidal channels) is likely to be **accessible to young anadromous fish**? As your answer, select one number from each row, then sum the four numbers and use their sum with the scale on the right to generate a score for the box.	0 = 0.01 1 = 0.1 2 = 0.2 3-4 = 0.3 5-6 = 0.4 7-8 = 0.5 9-10 = 0.6 11-12 = 0.7 13-14 = 0.8 15-16 = 0.9 >15 = 1.0	Assume conditions are averaged over February—June. If the site cannot be visited repeatedly, answer this based on visual estimation of the topography of the wetland relative to the tidal amplitude reported from the closest monitoring station in the estuary (see **Tidal range in Oregon estuaries**, below) or improved local data (where available). Salmonid distribution maps are available on the internet at: rainbow.dfw.state.or.us/nrimp/information/fishdistmaps.htm

during:	0% (none)	1-10%	10-50%	50-90%	>90%
Monthly low tide	0	4	5	6	7
Daily low tide	0	3	4	5	6
Daily high tide	0	2	3	4	5
Monthly high tide	0	1	2	3	4

score #25: 0.8

certainty #25:

Used for: Xpt, Afish, Mfish, Rfish, Dux, LbirdM, [NFW].

Tidal range in Oregon estuaries (mostly from Hamilton 1984). Use better local data when available.

estuary	location	daily range (ft.)	monthly range (ft.)	estuary	location	daily range (ft.)	monthly range (ft.)	estuary	location	daily range (ft.)	monthly range (ft.)
Necanicum	Seaside	4.7	5.8	**Siletz**	Taft	5.0	6.1	**Umpqua**	Winchester	5.1	6.9
Nehalem	Brighton	5.9	7.8		Kernville	4.6	6.6		Reedsport	5.1	6.7
	Wheeler	5.9	7.6	**Yaquina**	So. Beach	6.3	8.3	**Coos**	mouth	5.2	7.0
	Nehalem	5.6	7.2		Yaquina	6.2	8.2		Charleston	5.7	7.5
Tillamook	Barview	6.2	8.2	**Alsea**	Waldport	5.8	7.7		Empire	4.9	6.7
	Garibaldi	5.9	7.8		Drift Cr.	5.0	6.2		Coos Bay	5.6	7.3
	Bay City	5.4	7.1	**Siuslaw**	mouth	5.5	7.3	**Coquille**	Bandon	5.2	7.0
	Tillamook	5.2	6.6		Florence	5.4	7.3	**Rogue**	Wedderburn	4.9	6.7
Netarts	Whiskey Cr.	4.8	7.8		Cushman	5.5	7.3	**Chetco**	Brookings	5.1	7.0
Sand Lake	---	5.7	---		Tiernan	5.9	7.7				
Nestucca	mouth	5.8	7.6		Mapleton	6.2	8.0				

MHHW 9.53
MHW 8.63
MLW 1.87
MLLW 0.76

8.63
1.87
6.76

Kodiak gage data – Women's Bay

daily range
6.76ft

monthly
8.77 ft

code	indicator	score	guidance
26. Shade	Percent of the entire wetland's vegetated area that is **shaded** by trees or topography: | % | score | |---|---| | <1% | **0.01** | | 1-10% | **0.50** | | >10% | **1.00** |	score #26: 0.01 certainty #26:	To count, it must be shaded for 4+ hours during an average cloudless day. Include parts of the *internal channel* network that are inundated most days and are shaded by deep incision, logs, or undercut banks. *Internal channels* include both tributary channels (flowing from uplands) and blind channels (flooding with the incoming tide). Used for: AProd, [WQ, Xpt, Inv, Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
27. ShadeLM	[Skip if no low marsh is present.] Percent of *only* the low marsh that is **shaded** by trees or topography: | % | score | |---|---| | <1% | **0.01** | | 1-10% | **0.50** | | >10% | **1.00** |	score #27: 0.01 certainty #27:	See above. As a reminder, "low marsh" is defined as areas flooded by the tide during the majority of days during most months of the year. Low marsh is not limited just to areas that flood every day. Used for: Afish.
28. Bare	Area of **bare substrate**, including *pannes*, shallow pools, and tideflats wider than 2m and located *within* the wetland: | area | score | |---|---| | 0-4 sq. m | **0.01** | | 4-100 sq.m | **0.25** | | 100-2,500 sq.m | **0.50** | | 2,500-10,000 sq.m | **0.75** | | >10,000 sq.m | **1.00** |	score #28: 0.50 certainty #28:	*Pannes* = shallow mostly-bare depressions in the marsh surface and aren't currently a part of tidal channels. Assess condition as at low tide. Used for: AProd, NFW, Dux, Sbird, [WQ, Xpt, Inv, Afish, Mfish, Rfish, NFW, Sbird, LbirdM].

19000F

code	indicator	score	guidance
29. Pannes	Area only of **pannes** and shallow *isolated* pools (not tideflats): area / score 0-4 sq. m — **0.01** 4-100 sq.m — **0.25** 100-2,500 sq.m — **0.50** 2,500-10,000 sq.m — **0.75** >10,000 sq.m — **1.00** 5000SF	score #29: 0.50 certainty #29:	*Isolated* = lacking a surface connection to other waters during daily low tide Used for: Inv, Rfish, [Afish, Mfish, Sbird, LbirdM].
30. TranAng	**Transition angle** along most of the wetland *external edge:* transition angle / score gradual, or steep but stable — **0.01** ✓ steep, with extensive erosion and undercutting — **1.00**	score #30: 0.01 certainty #30:	*External edge* = the edge between the marsh and adjoining bay or tidal river. Used for: WQ.
31. UpEdge	Percent of the wetland's entire *perimeter* that is **upland**, i.e., *neither* water, non-tidal wetland, nor tideflat: % / score <1 — **0.01** 1-25 — **0.25** 25-50 — **0.50** ✓ 50-75 — **0.75** ✓ >75 — **1.00**	score #31: 0.75 certainty #31:	*Perimeter* = the wetland's edge with upland plus with unvegetated water or tideflat. Do not include internal channels in the calculation of the marsh perimeter. If possible, use computer GIS software to measure the perimeter and edges. Used for: WQ, LbirdM.

code	indicator	score	guidance
32. LWDchan	Number of pieces of **large woody debris (LWD) in** wetland's tidal channel network: **# LWD in channel** / **score** 0, or no channels present — **0.01** ✓ 1-10 — **0.50** >10 — **1.00**	**score #32:** 0.01 **certainty #32:**	To count, the LWD must have a diameter >15 cm and a length >2m. Used for: Inv, Afish, [Rfish, Mfish, Sbird, LbirdM].
33. LWDmarsh	Number of **LWD projecting** at least 1m above the wetland surface: **# LWD above surface** / **score** 0 — **0.01** 1-4 — **0.25** ✓ 5-9 — **0.50** 10-30 — **0.75** >30 — **1.00**	**score #33:** 0.25 **certainty #33:**	Used for: LbirdM.
34. LWDline	**Driftwood line** as % of wetland's upland edge length: **%** / **score** 0 — **0.01** 1-9 — **0.25** 10-29 — **0.50** 30-59 — **0.75** >59 — **1.00**	**score #34:** 0.01 **certainty #34:**	Driftwood line = LWD arranged naturally in a linear pattern, usually parallel to upland, as a result of tides. (Driftwood lines are often close to the elevation of annual high tide) Used for: Inv, LbirdM, [Afish, Mfish, Rfish, NFW, Sbird.]

<table>
<tr><th>code</th><th>indicator</th><th>scale/score</th><th>guidance</th></tr>
<tr><td>35.
TribL</td><td>Cumulative length (in miles) of fish-accessible non-tidal tributary channels that feed into the wetland:

<table><tr><th>length</th><th>score</th></tr><tr><td><3mi.</td><td>0.01</td></tr><tr><td>3-10mi.</td><td>0.05</td></tr><tr><td>>10mi.</td><td>1.00</td></tr></table></td><td>score #35:
0.01

certainty #35:</td><td>Measure only the tributary channels that pass through the wetland. Don't count the adjoining main river channel. Estimate length beginning at the wetland's upland margin and extending to the upstream limit of fish-accessible waters. ODFW has information on salmonid use areas: rainbow.dfw.state.or.us/nrimp/information/fishdistmaps.htm

Used for: Xpt, Inv, Afish, NFW, Dux, LbirdM, [Mfish, Rfish, Sbird].</td></tr>
<tr><td>36.
Fresh</td><td>Types of freshwater sources that feed the wetland internally.

Select the maximum score in each group and then sum the two maxima:

<table><tr><th>Group A: Flowing into the wetland</th><th>score</th></tr><tr><td>perennial fresh tributary</td><td>4</td></tr><tr><td>intermittent fresh tributary or stormwater pipe</td><td>2</td></tr><tr><td>neither</td><td>0</td></tr></table>✓

<table><tr><th>Group B: Adjoining on the uphill side</th><th>score</th></tr><tr><td>large* non-tidal freshwater wetland, pond, or spring</td><td>4</td></tr><tr><td>small non-tidal wetland, seep, or hydric soil patch</td><td>3</td></tr><tr><td>other land cover, and tidal wetland is not an island</td><td>1</td></tr><tr><td>tidal wetland occupies nearly all of an island</td><td>0</td></tr></table>✓
* wider than the tidal wetland (width measured perpendicular to slope)</td><td>sum = score
0 = 0.01
1 = 0.1
2 = 0.2
3 = 0.3
4 = 0.5
5 = 0.7
6 = 0.8
7 = 0.9
8 = 1.00

score #36:
0.1

certainty #36:</td><td>Do not count major rivers adjoined by the wetland as freshwater sources. Perennial tributaries flow year-round most years. Intermittent tributaries flow seasonally and have recognizable channels extending uphill at least twice the width of the tidal marsh. Non-tidal wetlands on the Oregon Coast are typically dominated by alder, willow, cattail, skunk cabbage, slough sedge, small-fruited bulrush, and water parsley (some of these occur to a lesser degree in tidal wetlands). Adjoining means present within 10m.

Oregon coastal soils considered to be hydric are Blacklock, Bragton, Brallier, Brenner, Chetco, Clatsop, Coquille, Depoe, Fluvaquents, Hebo, Heceta, Langlois, Riverwash, Willanch, and Yaquina. Many others contain hydric inclusions.

Used for: AProd, Afish, NFW, Dux, LbirdM, [WQ, Xpt, Inv, Mfish, Rfish, Sbird].</td></tr>
</table>

<table>
<tr><th>code</th><th>indicator</th><th>scale/score</th><th>guidance</th></tr>
<tr><td>37.
Width</td><td>Wetland's width at its widest part:
<table><tr><th>width ft.</th><th>score</th><th>width ft.</th><th>score</th></tr><tr><td><100</td><td>0.01</td><td>600–700</td><td>0.6</td></tr><tr><td>100–200</td><td>0.1</td><td>700–800</td><td>0.7</td></tr><tr><td>200–300</td><td>0.2</td><td>800–900</td><td>0.8</td></tr><tr><td>300–400</td><td>0.3</td><td>900–1,000</td><td>0.9</td></tr><tr><td>400–500</td><td>0.4</td><td>>1,000</td><td>1.0</td></tr><tr><td>500–600</td><td>0.5</td><td></td><td></td></tr></table></td><td>score #37:
0.2

certainty #37:</td><td>Measure this as a perpendicular line from aquatic (unvegetated river or bay edge or tideflat) to upland edge. If site is an island with no upland, measure to the water edge on opposite side of the island.

Used for: WQ, Xpt, Dux, Sbird.</td></tr>
<tr><td>38.
MudW</td><td>Maximum width of largest tideflat that adjoins the wetland:
<table><tr><th>width ft.</th><th>score</th><th>width ft.</th><th>score</th></tr><tr><td><100</td><td>0.01</td><td>600–700</td><td>0.6</td></tr><tr><td>100–200</td><td>0.1</td><td>700–800</td><td>0.7</td></tr><tr><td>200–300</td><td>0.2</td><td>800–900</td><td>0.8</td></tr><tr><td>300–400</td><td>0.3</td><td>900–1,000</td><td>0.9</td></tr><tr><td>400–500</td><td>0.4</td><td>>1,000</td><td>1.0</td></tr><tr><td>500–600</td><td>0.5</td><td></td><td></td></tr></table></td><td>score #38:
0.1

certainty #38:</td><td>Measure this using a USGS topographic map or (preferably) field observation at low tide, as a perpendicular to the external edge of wetland, or measure it to the external edge of other wetlands or flats on either side (contiguous to the wetland being measured).

Used for: NFW, Sbird.</td></tr>
<tr><td>39.
Roost</td><td>[Skip if the wetland contains no low marsh.]
Number of types of potential shorebird roosts within 1.5 mi. of the center of the wetland (check all that are present):

N treeless high marsh, mostly wider than 300 ft
N treeless uninhabited islands (dry at high tide)
N beaches or bars, mostly wider than 100 ft at high tide
N nontidal marsh/pond, mostly wider than 300 ft
Y unvegetated dike or jetty
N seasonally flooded pasture >40 acres
N sewage treatment lagoon

Add the number of checkmarks and use scale at right to derive score.</td><td>0 = 0.01
1 = 0.25
2-3 = 0.50
4-5 = 0.75
6-7 = 1.00

score #39:
0.25

certainty #39:</td><td>Include these if they occur within the wetland as well.

Used for: Sbird.</td></tr>
</table>

code	indicator	score	guidance
40. Island	Wetland comprises all or part of an uninhabited **island**: **description** / **score**: wetland comprises all or part of island; *and* the island contains essentially no high marsh or undeveloped upland, i.e., is completely underwater during daily high tide — **0.01** wetland comprises all or part of island; *and* the island contains some high marsh and/or undeveloped upland, this being **less** than the area of low marsh — **0.33** wetland comprises all or part of island; *and* the island contains some high marsh and/or undeveloped upland, this being **greater** than the area of low marsh — **0.66** wetland does not comprise all or part of island — **1.00**	**score #40:** 1.0 **certainty #40:**	*Island* = land not permanently flooded and completely separated from upland at low tide by water at least 3 ft deep and 20 ft wide. Used for: Inv, Dux, LbirdM, [Afish, Mfish, Rfish, Sbird, NFW].

code	indicator	score	guidance
41. Fetch	Direction and distance of external edge's exposure to intense **wave and/or river current action**. Enter the maximum appropriate number in the box to the right.	**score #41:** 0.01 **certainty #41:**	*Dropoff* = the slope and bathymetry of deeper-water areas within about 30 ft of the marsh edge, not just to the marsh edge itself. If local wind data show strongest waves consistently coming from a direction other than SE, S, or SW, you may modify the headers on this table to that direction. Maroon faces west and is protected by a barrier bar. Used for: WQ, Inv, Dux, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].

	SE, S, or SW exposure, and distance is:		
	<100'	**100 – 1,000'**	**>1,000'**
External edge mostly protected by dikes, levees, upland topography.	**0.01** (or marsh's external edge faces a direction other than SE, S. or SW)	**0.01**	**0.01**
Gradual *drop-off* to deeper water; and large-boat traffic and severe river floods are both infrequent.	**0.3**	**0.6**	**0.8**
Sharp drop-off to deeper water; and/or large-boat traffic nearby; and/or large river floods are frequent. No protection. Driftwood often abundant.	**0.5**	**0.8**	**1.00**

code	indicator	scale/score	guidance
42. Pform	Number of easily-recognizable **vegetation structures** present within the wetland. Check all that predominate over at least 100 sq.ft: Y large robust grass-like plants (e.g., bulrush, cattail) Y other large native grass-like plants (mostly >8 inches long, e.g., *Deschampsia, Hordeum, Juncus*) <100 fleshy, succulent plants (e.g., pickleweed) <100 other non-woody plants (e.g., saltmarsh aster, other forbs) N *nurse logs* supporting plants taller than 1 ft. N submersed aquatics (e.g., wigeongrass or eelgrass) in internal channels or pools or externally within 50 ft. Derive score by comparing the number of items checked above with the scale in the next column.	0-2 = 0.01 3 = 0.25 4 = 0.50 5 = 0.75 6 = 1.00 **score #42:** 0.01 **certainty #42:**	*Nurse logs* = large logs or stumps present on the marsh surface which, because of the elevated substrate they provide, protect germinating plants on top of the log from potentially lethal long-duration flooding and high salinity. Used for: AProd, Xpt, Inv, Dux, LbirdM, [WQ, Afish, Mfish, Rfish, NFW, Sbird].
43. FormDiv	Number of easily-recognizable **vegetation forms** within the wetland or *directly adjoining* its upland edge, from this list. For live vegetation, these *must* be present along >5% of upland edge or that comprise >5% of the wetland area: N grazed or mowed grass and/or forbs Y ungrazed & unmowed grass and/or forbs N shrubs 2-6 ft tall, conifer Y shrubs 2-6 ft tall, deciduous N shrubs 6-20 ft tall, conifer Y shrubs 6-20 ft tall, deciduous Y live trees 20-60 ft tall, conifer Y live trees 20-60 ft tall, deciduous Y live trees >60 ft tall, conifer N live trees >60 ft tall, deciduous N standing snags, <6" diameter N standing snags, >6" diameter Derive score by comparing the number of items checked above with the scale in the next column.	1 = 0.01 2 = 0.2 3 = 0.3 4 = 0.4 5 = 0.5 6 = 0.6 7 = 0.7 8 = 0.8 9 = 0.9 >9 = 1.0 **score #43:** 0.6 **certainty #43:**	*Directly adjoining* = unobscured by a tree canopy. Used for: Inv, LbirdM, [Afish, Mfish, Rfish, NFW, Sbird].

code	indicator	score	guidance
44. Alder	Percent of upland edge bounded (within 50 ft.) by **alder**: | % | score | |---|---| | <1 (or no upland) | **0.01** | | 1-10 | **0.33** | | 10-50 | **0.66** | | >50 | **1.00** |	score #44: 0.01 certainty #44:	Other deciduous plant species known to fix nitrogen (not simply take it up from the soil) may be included as well. Used for: Inv, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
45. Eelg	Presence of **eelgrass** (either species): | presence | score | |---|---| | not detected | **0.01** | | observed only in adjoining waters or flats | **0.50** | | observed within the wetland's internal channels | **1.00** |	score #45: 0.01 certainty #45:	Based either on observations from shore (up to 50 ft. away), boat, or published reports or maps. "Certainty" should be scored low if no eelgrass is detected because detection at a distance can be difficult or impossible. Used for: Inv, Dux, [Afish, Mfish, Rfish, NFW, Sbird, LbirdM].
46. SoilFine	*Predominant* **soil texture** in most of the wetland: | soil texture | score | |---|---| | coarse sand, gravel | **0.01** | | fine sand | **0.40** | | silt, loam, muck, peat | **1.00** |	score #46: 0.40 certainty #46:	Assess this from county soil survey maps, unless better data are available from onsite examination of the upper 12 inches of the soil at several locations in the wetland. *Predominant* = occupying the greatest proportion of the surface area of a site. Used for: WQ.

code	indicator	score	guidance
47. EstuSal	**Tidal marsh acreage** in this wetland's major estuary:	score #47: 0.66	The salinity zones are not based on salinity within the wetland, but rather in the adjoining bay or river. These categorizations of estuaries are based on very limited salinity data and may be revised.

description	score
Tidal marshes are absent (or nearly absent) from two of the three salinity zones (fresh, brackish, saline): Netarts, Siltcoos, Tenmile, Elk River, Chetco.	**0.01**
Tidal marshes are absent (or nearly so) from one of the three salinity zones, with one of the two remaining zones having much more marsh acreage than the other: Sand Lake, Salmon, Beaver Cr., Coquille, New River, Rogue, Winchuck.	**0.33**
Tidal marshes are present in all three zones, with one zone containing more than 50% of the estuary's marsh acreage: Nehalem, Tillamook, Nestucca, Yaquina, Alsea, Coos.	**0.66**
Tidal marshes are present in all three zones, with no zone containing more than 50% of the estuary's marsh acreage: Necanicum, Siletz, Siuslaw, Umpqua.	**1.00**

certainty #47:

Used for: Afish, Mfish, Rfish, [WQ, Inv, NFW, Sbird, LbirdM].

<table>
<tr><th>code</th><th>indicator</th><th>score</th><th>guidance</th></tr>
<tr><td>48.
SeaJoin</td><td>Estuary connection with ocean.

<table><tr><th>description</th><th>score</th></tr><tr><td>Estuarine connection to ocean is lost regularly, at least once every 1-10 yrs (some “blind” estuaries and coastal lagoons).</td><td>0.01</td></tr><tr><td>Usually connected to ocean, and almost the entire estuary is saline due to minimal freshwater input (as in some “bar built” estuaries).</td><td>0.50</td></tr><tr><td>Always connected to ocean, with much freshwater input from feeder streams and/or river.</td><td>1.00</td></tr></table></td><td>score #48:
1.00

certainty #48:</td><td>Used for: Afish, Mfish, [NFW].</td></tr>
<tr><td>49.
Estu%WL</td><td>Relative dominance of undiked tidal wetlands in this estuary.

Use the score from the appropriate estuary in this list:

Alsea = 0.8; Beaver Cr .= 0.9; Chetco = 0.1; Coos Bay = 0.7;
Coquille = 0.5; Ecola = 0.5; Elk R. = 0.3; Euchre-Greggs Cr. = 0.3;
Necanicum = 0.7; Nehalem = 0.9; Nestucca = 0.4; Netarts = 1.0;
New River = 0.8; Pistol = 0.2; Rogue = 0.2; Salmon = 1.0;
Sand Lake = 0.3; Siletz = 0.9; Siltcoos = 0.5; Siuslaw = 1.0;
Sixes= 0.2; Ten Mile = 0.8; Tillamook = 0.6; Two Mile = 0.4;
Umpqua = 0.7; Winchuck = 0.1; Yaquina = 0.8</td><td>score #49:

certainty #49:</td><td>Numbers were based on ratio of tidal marsh to subtidal water, as well as on total acres of tidal marsh. They do not account for previous extent or historical losses of tidal wetlands.

NA

Used for: Afish, [NFW].</td></tr>
</table>

<table>
<tr><th>code</th><th>indicator</th><th>score</th><th>guidance</th></tr>
<tr>
<td>50.
WetField%</td>
<td>Percent of land within 1.5 mi. that appears (in a 1:24,000 scale aerial photograph) to be ponds, lakes, nontidal marsh, sewage lagoons, cropland, or pasture in flat terrain.
<table>
<tr><th>%</th><th>score</th></tr>
<tr><td><5</td><td>0.01</td></tr>
<tr><td>5-9</td><td>0.25</td></tr>
<tr><td>10-19</td><td>0.50</td></tr>
<tr><td>20-29</td><td>0.75</td></tr>
<tr><td>>29</td><td>1.00</td></tr>
</table>
</td>
<td>score #50:
0.01

certainty #50:
0.01</td>
<td>Flat terrain = slopes less than about 10%.
After drawing a circle of 1.5 mi. radius from the wetland center (4 inches on a 1:24,000 scale aerial photograph or map), measure the acreage of the named cover types and divide by 45.24 to get the percent. Performing this measurement with a GIS is preferred.

If no access to aerial photographs, attempt to estimate but score certainty "0.01".

Used for: NFW, Sbird, Dux.</td>
</tr>
<tr>
<td>51.
BuffCov</td>
<td>Percent of the area surrounding this wetland that appears (in a 1:24,000 scale aerial photograph) to be developed or persistently bare.
<table>
<tr><th></th><th><5%</th><th>6-14%</th><th>15-24%</th><th>>25%</th></tr>
<tr><td>within 1500 ft:</td><td>0.50</td><td>0.25</td><td>0.15 ✓</td><td>0.10</td></tr>
<tr><td>within 3000 ft:</td><td>0.50</td><td>0.20</td><td>0.10</td><td>0.01 ✓</td></tr>
</table>
Select one number from each row and sum them to derive the score.
</td>
<td>score #51:
0.16

certainty #51:
0.01</td>
<td>Developed = lawns, landscaping, pavement, buildings.
Persistently bare = bare compacted soil or rock (not sand dunes).

After drawing a circle of 1500 ft. outward from the wetland center (3/4 inch on a 1:24000 aerial photograph or map), subtract from 162 acres (the area of the circle) the acreage of any included tidelands. Then divide the developed acres you measured by this number. Do likewise for the 3000' circle, but substitute 650 for 162. Multiply the results by 100 to get percent. Performing this measurement with a GIS is preferred. If no access to aerial photographs, attempt to estimate but score certainty "0.01".

Used for: NFW, LbirdM.</td>
</tr>
</table>

code	indicator	score	guidance
52. BlindL	**Internal channel complexity.** While viewing a 1:24,000 scale aerial photograph, imagine all the wetland's *blind channel* segments strung end-to-end and straightened out. Relative to the wetland's *width*, would their cumulative length be: **length relative to width** / **score** less than half (50%) — **0.01** ✓ 50-100% — **0.20** 1-1.9 times longer — **0.40** 2-2.9 times longer — **0.60** 3-3.9 times longer — **0.80** >3.9 times longer — **1.00**	**score #52:** 0.01 **certainty #52:**	*Blind channels* = channels located entirely within the wetland (do not originate in adjoining uplands) that flood with the incoming tide. *Width* = the wetland's maximum width measured perpendicular to adjoining bay or river. If no access to aerial photographs, attempt to estimate but score certainty "0.01". Used for: AProd, WQ, Xpt, Inv, Afish, Mfish, Rfish, [NFW, Sbird, LbirdM].

code	indicator	score	guidance
53. Exits	Number of internal **channel exits**. Count these using a 1:24000 aerial photograph and enter in the bottom box ("datum") in the next column. Then in the top row of the relevant table below (A or B), find the wetland edge length. In that column find the number of channel *exits* this wetland has. Then look along that row to the last column for the resulting score. A. Wetlands on **silt, clay, or muck** substrate:	**score #53:** 0.01 **certainty #53:** **datum #53:** 0	*Exits* = where internal channels flow into unvegetated waters or tideflats outside of the wetland. *External wet edge length* is measured as the wetland's edge with unvegetated water or tideflat at low tide. For channels that connect at both ends to a tideflat or unvegetated bay or river, count both ends as exits. Do not count constructed drainage ditches. IMPORTANT: The number of exits is strongly related to marsh size, substrate type, and HGM subclass—sometimes even more than to marsh disturbance. See note for #52, above. If no access to aerial photographs, attempt to estimate but score certainty "0.01". Used for: AProd, WQ, Xpt, Inv, Afish, Mfish, Rfish, [NFW, Sbird, LbirdM].

length of *external wet edge* (ft)			
<1000'	**1000-3400'**	**>3400'**	**score**
0 exits	0 exits	0 exits	**0.01**
1	1-2	1-3	**0.25**
2	3-5	4-6	**0.50**
3-4	6-10	7-12	**0.75**
>4	>10	>15	**1.00**

B. Wetlands on **sand** substrate:

exits	score
0	**0.01**
1	**0.50**
>1	**1.00**

<table>
<tr><th>code</th><th>indicator</th><th>score</th><th>guidance</th></tr>
<tr>
<td>54.
JuncMax</td>
<td>Number of internal channel junctions.

Count these along the single longest internal channel, using a 1:24000 scale aerial photograph, and enter in the bottom box ("datum") in the next column.

Then in top row of the relevant table below (A or B), find the wetland area. In that column find the number of channel junctions this wetland has. Then look in along that row for the last column for the resulting score.

A. Wetlands on silt, clay, or muck substrate:
<table>
<tr><th colspan="3">wetland area (acres)</th><th rowspan="2">score</th></tr>
<tr><th>< 8</th><th>8-30</th><th>>30</th></tr>
<tr><td>0 jcts</td><td>0 jcts</td><td>0 jcts</td><td>0.01</td></tr>
<tr><td>1</td><td>1</td><td>1-4</td><td>0.50</td></tr>
<tr><td></td><td>2-3</td><td>5-7</td><td>0.75</td></tr>
<tr><td>>1</td><td>>3</td><td>>8</td><td>1.00</td></tr>
</table>
B. Wetlands on sand substrate:
<table>
<tr><th>junctions</th><th>score</th></tr>
<tr><td>0</td><td>0.01</td></tr>
<tr><td>1</td><td>0.50</td></tr>
<tr><td>>1</td><td>1.00</td></tr>
</table>
</td>
<td>score #54:
0.01

certainty #54:

datum #54:
0</td>
<td>Junctions = visible confluences between two internal tidal channels regardless of their relative sizes.

Do not count constructed drainage ditches.

Important: The number of channel junctions is strongly related to marsh size, substrate type, and HGM subclass – sometimes even more than to marsh disturbance. See note for #52, above.

If no access to aerial photographs, attempt to estimate but score certainty "0.01".

Used for: AProd, WQ, Xpt, Inv, Afish, Mfish, Rfish, [NFW, Sbird, LbirdM].</td>
</tr>
<tr>
<td>55.
FreshSpot</td>
<td>Internal freshwater.

At a given point in time, the maximum difference between salinity in unconfined waters within the wetland vs. outside the wetland is:
<table>
<tr><th>difference</th><th>score</th></tr>
<tr><td>internal is <10 ppt fresher, or is more saline</td><td>0.01</td></tr>
<tr><td>internal is 10-20 ppt fresher</td><td>0.50</td></tr>
<tr><td>internal is >20 ppt fresher</td><td>1.00</td></tr>
</table>
</td>
<td>score #55:
0.50

certainty #55:
0.01</td>
<td>Measure salinity from tidal water (internal channel or pool), preferably around the time of low tide, and subtract from salinity measured (almost) simultaneously in the adjoining bay or river. If possible, repeat during other seasons and use the greatest differential, which often is in mid-summer. Do not measure if any rainfall has occurred in last 24 hours.

If no access to a refractometer, attempt to categorize based on any observed sources of freshwater input, but score certainty "0.01".

Used for: AProd, Afish, NFW, Dux, LbirdM, [WQ, Xpt, Inv].</td>
</tr>
</table>

Primary Production and Exporting Aboveground Production

highest function value	suggested score (0 to 1)	lowest function value
___ The wetland's tidal marsh plants are extensively and sustainably grazed, and livestock are an important part of the local economy.	#101: .2	✓ The wetland currently is not grazed and, due to wetness or its location, has little potential as pasture.
___ The wetland's estuary has not experienced major die-offs of marine animals as a result of diminished dissolved oxygen.	#102:	___ The wetland's estuary has experienced frequent and major die-offs of marine animals as a result of diminished dissolved oxygen, and the wetland is near the estuary mouth or other areas where this has occurred.
___ Uplands in this estuary, especially those closest to the water, are largely devoid of vegetation, e.g., sand dunes, pavement.	#103: .6	___ Uplands in this estuary are completely vegetated.
___ The site is one of only a few, or is one of the largest ones, of its subclass* in this estuary that supports and exports primary production to at least this degree.	#104: .8	___ Sites of this subclass and size that support and/or export primary production to this degree are relatively abundant in this estuary.
___ Other factors suggest that primary production specifically from this wetland is of unusually great importance to food webs located in the wetland or in receiving waters of the adjoining estuary or river. Explain:	#105: .8	___ Other factors suggest that primary production specifically from this wetland is not especially important to food webs located in the wetland or in receiving waters of the adjoining estuary or river. Explain:

* Tidal wetlands are provisionally labeled by their HGM subclasses in maps on the accompanying DVD.

.8

Maintaining Element Cycling Rates and Pollutant Processing and *Stabilizing Sediment*

highest function value	suggested score:	lowest function value
opportunity to perform these functions:		
___ Element inputs to the wetland may be relatively large as suggested by a score of 1.00 for items NutrIn, ChemIn, BuffAlt, and/or SedShed in the accompanying spreadsheet.	#106: .8	___ Element inputs to the wetland may be relatively small as suggested by a score of 0.01 for NutrIn, ChemIn, BuffAlt, and/or SedShed.
___ Large populations of salmon spawn very near the wetland.	#107: 1	___ Populations of spawning salmon are absent from this river basin.
___ Substantial volumes of woody and other organic matter enter the river or estuary a short distance upriver from the wetland as a result of recent fires, logging, or other factors.	#108: .4	___ Inputs of woody and other organic matter to the wetland are probably at or below historical (pre-settlement) rates. (naturally low)
___ Validated computer models of watershed processes indicate major net influx of sediments, nutrients, or metals to this estuary and wetland.	#109: NA	___ Validated computer models of watershed processes indicate no major delivery of sediments, nutrients, or metals to this estuary or wetland.
significance of this wetland (assuming these functions occur):		
___ The site is near the estuary's main head of tide.	#110: .6	___ The site is near the estuary mouth (where its individual effect, if any, may be dwarfed by marine circulation).
___ Rapid sedimentation and shoaling near the mouth of this estuary is a major concern and expense and/or the estuary is regularly dredged.	#111: .2	✓ Sedimentation and shoaling near the mouth of this estuary are not a major concern or expense; no dredging occurs.
___ The wetland's estuary has experienced frequent and major die-offs of marine animals as a result of diminished dissolved oxygen. The wetland is capable of processing internally much of the carbon it produces or imports, and thus avoids contributing to this problem. The wetland also is near the estuary mouth or other areas where severe oxygen deficits have occurred.	#112: .2	✓ The wetland's estuary has not experienced major die-offs of marine animals as a result of diminished dissolved oxygen. not 100% sure
___ The wetland is one of only a few of its subclass and size in this estuary that may stabilize sediments, remove nitrogen, and/or process carbon & pollutants to this or greater degree.	#113: .8	___ Wetlands of this subclass and size, that remove nitrogen or process carbon & pollutants to this or greater degree, are abundant in this estuary.
___ Other factors suggest that element cycling and removal functions of this wetland are of unusually great importance to biological or human resources in the wetland or in receiving waters of the estuary or river. Explain: Significance of Buskin River fisheries	#114: .8	___ Other factors suggest that element cycling and removal functions of this wetland are not atypically important to biological or human resources in the wetland or in receiving waters of the estuary or river. Explain:

opp. .6

sig. .8

Maintaining Invertebrate Habitat (nothing yet - next month)

highest function value	suggested score:	lowest function value
___ This estuary ranks as one of the best for revenue and/or jobs from harvesting of crabs and other native mobile invertebrates.	#115: 0.2	___ This estuary supports little or no revenue and/or jobs from harvesting of native crabs and other native mobile invertebrates.
___ The wetland is one of a very few known on the ~~Oregon~~ AK coast known to be used by a particular native invertebrate species, and it otherwise supports a normal assemblage of invertebrates..	#116: 0.2	___ All invertebrate species known from this wetland are widespread in tidal wetlands of the ~~Oregon~~ AK coast.
___A large portion of the uplands and deeper waters near this wetland have very limited capacity to support invertebrates, e.g., largely devegetated, chemical contamination, frequent soil or sediment disturbance.	#117: 0.2	___✓ Upland and deepwater areas near this wetland have considerable capacity to support invertebrates, e.g., land cover is mostly unaltered, sedimentation is normal, there is little or no chemical contamination.
___ The site is one of only a few, or is one of the largest ones, of its subclass in this estuary that support native invertebrates to this or greater degree.	#118: 0.2	___ Sites of this subclass and size that support native invertebrates to this or greater degree are relatively abundant in this estuary.
___ Other factors suggest that invertebrate species or densities produced at this site are of unusually great importance to food webs or ecological processes in the wetland or its estuary. Explain:	#119: ,2	___ Other factors suggest that invertebrate species or densities produced at this site are not atypically important to food webs or ecological processes in the wetland or its estuary. Explain:

Cathleen Williamson - SWCA 0.2

not listed in AK but there is use.

Maintaining Anadromous Fish

highest function value	suggested score:	lowest function value
√ One or more ~~federally-listed~~ anadromous fish species or subpopulations are known to use this particular wetland frequently and extensively during critical periods.	#120: .1	___ No ~~federally-listed~~ anadromous fish species (or recognized subpopulation) is known from the wetland or nearby waters.
___ In the past, considerable funds have been expended to restore or enhance this particular wetland specifically for (among perhaps many objectives) anadromous fish.	#121: .2	___ In the past, no funds have been expended to restore or enhance this particular wetland specifically for anadromous fish.
___ The site is one of only a few, or is one of the largest ones, of its subclass and size in this ~~estuary~~ area that supports anadromous fish to this or greater degree.	#122: .4	___ Sites of this subclass and size that support anadromous fish to this or greater degree are relatively abundant in this ~~estuary~~. area.

juveniles have present - flushes quickly. .8

Maintaining Habitat for Resident Fish and *Maintaining Habitat for Visiting Marine Fish*

highest function value	suggested score:	lowest function value
√ This estuary ranks as one of the best for revenue and/or jobs from harvesting of resident and visiting marine fish.	#123: .6	___ This estuary supports little or no revenue and/or jobs from harvesting of resident and visiting marine fish.
___ The wetland is one of a very few on the ~~Oregon~~ AK coast known to be used by a particular non-anadromous fish.	#124: .4	___ All non-anadromous fish species known from this wetland are widespread in tidal wetlands of the ~~Oregon~~ AK coast.
√ The wetland or closely connected waters provide some of the most consistently productive fishing for native tidal marsh fish species and/or marine species on the ~~Oregon~~ AK coast.	#125: .6	___ Site does not provide atypically productive fishing for any native tidal marsh fish species or marine species on the ~~Oregon~~ AK coast.
___ The site is one of only a few, or is one of the largest ones, of its subclass in this estuary that supports non-anadromous fish to at least this degree.	#126: .6	___ Sites of this subclass and size that support non-anadromous fish to this degree or greater are relatively abundant in this estuary.
___ Other factors suggest that non-anadromous fish species or densities of native mobile invertebrates inhabiting the wetland are of unusually great importance to food webs or ecological processes in the wetland or closely connected waters. Explain:	#127: .4	___ Other factors suggest that non-anadromous fish species or densities of native mobile invertebrates inhabiting the wetland are not atypically important to food webs or ecological processes in the wetland or closely connected waters. Explain:

Resident - yes sculpin / flounder stickleback.

.6

Maintaining Habitat for Ducks and Geese and *Maintaining Habitat for Shorebirds*

Some potential sources of data:

www.ohjv.org/pdfs/northern_oregon_coast.pdf
www.ohjv.org/pdfs/southern_oregon_coast.pdf
www.oregoniba.org/
www.oregoniba.org/links.htm
www.wetlandsconservancy.org/oregons_greatest.html
audubon2.org/webapp/watchlist/viewWatchlist.jsp

highest function value	suggested score:	lowest function value
___ The wetland is consistently and/or extensively used by many waterbird species that are regionally uncommon and/or have declining populations in the Pacific Northwest.	#128: .2	___ All waterbird species that regularly use the wetland are common and widespread over most of the ~~Oregon~~ AK coast, and the wetland is distant from areas used by waterbird species that are regionally uncommon and/or have declining populations in the Pacific Northwest.
___ The wetland is one of a very few that contains habitat conditions identified as optimal for one or more particularly rare and/or regionally declining waterbird species.	#129: .2	___ The wetland does not contain habitat suitable for any particularly rare and/or regionally declining waterbird species, nor is it near such areas.
___ The wetland or its estuary was identified as being of exceptional importance for waterbirds by the ~~Oregon Wetland Joint Venture Plan~~, North American Waterfowl Management Plan, or the North American Shorebird Plan.	#130: .2	___ Neither the wetland nor its estuary was identified as being of exceptional importance for waterbirds by the named documents, and is distant from such areas.
___ The wetland or its estuary is registered or has been formally proposed as an Important Bird Area (IBA) of the National Audubon Society.	#131: .2	___ The wetland is not within an estuary that is registered or formally proposed as an IBA, and is distant from such areas.
___ Other factors suggest that waterbird species or densities at this site are of unusually great importance to food webs or ecological processes in the wetland or estuary.	#132: .4	___ Other factors suggest that waterbird species or densities at this site are not atypically important to food webs or ecological processes in the wetland or estuary.
___ In the past, considerable funds have been expended to restore or protect specifically the suitability of this particular wetland for (among perhaps many objectives) waterbird habitat.	#133: .2	_Y_ In the past, no funds have been expended to restore or protect specifically the suitability of this particular wetland for waterbird habitat.
___ The site is one of only a few, or is one of the largest ones, of its subclass in this vicinity that support waterbirds to this degree.	#134: .4	___ Sites of this subclass and size that support waterbirds to at least this degree are relatively abundant in this estuary and elsewhere on the Oregon coast.

Hard to know.

Chinlak Bay is but not the estuary.

0.2

Maintaining Habitat for Native LandBirds, Small Mammals, and Their Predators and *Maintaining Habitat for Nekton-feeding Birds*

Some potential sources of data:

oregonstate.edu/ornhic/
www.oregoniba.org/
www.oregoniba.org/links.htm
audubon2.org/webapp/watchlist/viewWatchlist.jsp

highest function value	suggested score:	lowest function value
___ The wetland is consistently and/or extensively used by native land bird or mammal species that are listed as Threatened, Endangered, or Sensitive, or are recognized as conservation priority species or communities by Partners-in-Flight or the Oregon Natural Heritage Program.	#135: 0	___ No such species or communities are present in the wetland or nearby parts of the estuary.
__ Other native land bird or mammal species that are regionally uncommon and/or have declining populations in the Pacific Northwest are consistently and/or extensively present in the wetland.	#136: 0	___ All native land bird or mammal species that use this wetland occur widely on the Oregon coast and none are known to be declining at a regional scale.
___The wetland is one of a very few that contains habitat conditions identified as optimal for one or more particularly rare and/or regionally declining wetland-associated bird species (other than waterbirds).	#137: 0	___ The wetland does not contain habitat suitable for any particularly rare and/or regionally declining, wetland-associated bird species (excluding waterbird species).
___ Other factors suggest native land bird or mammal species or densities at this site are of unusually great importance to food webs or ecological processes in the wetland or its estuary.	#138: .4	___ Other factors suggest that native land bird or mammal species or densities at this site are not atypically important to food webs or ecological processes in the wetland or its estuary.
___ In the past, considerable funds have been expended to restore specifically the suitability of this particular site for (among perhaps many objectives) wetland-associated native land birds or mammals.	#139: .2	_X_ In the past, no funds have been expended to restore specifically the suitability of this particular site for wetland-associated native land bird or mammal species.
___ The site is one of only a few, or is one of the largest ones, of its subclass in this vicinity that support wetland-associated native land bird or mammal species to this degree.	#140: .2	___ Sites of this subclass and size that support native land bird or mammal species to this degree are relatively abundant both locally and regionally.

Hard to say

.2

Brown Bear
- mostly u.s. of estuary
Bald Eagle
- feed on salmon.

Maintaining Natural Botanical Conditions

Some potential sources of data:

www.oregonstate.edu/ornhic
www.npsoregon.org
cladonia.nacse.org/platlas/jclass/OPAJava20.htm
ocid.nacse.org/cgi-bin/qml/herbarium/plants/vherb.qml

highest function value	suggested score:	lowest function value
___ Site contains many native plant species or associations that are uncommon and/or have declining populations in Oregon coastal tidelands. This may include, but is not limited to, species categorized as G1, G2, S1, or S2 by the Oregon Natural Heritage Program.	#141: .2	___ All plant species and associations at this site also occur widely in ~~Oregon~~ AE coastal tidelands, and none have been documented to be declining in the ecoregion.
___ Site is one of a very few that contains habitat conditions identified as optimal for one or more particularly rare and/or regionally declining native plant species or associations. This includes, for example, sites with extensive woody vegetation (especially Sitka spruce) that are regularly flooded by tides. In Oregon this is a relatively rare type of wetland that has declined dramatically.	#142: .2	___ Site does not contain habitat suitable for any particularly rare and/or regionally declining native plant species or association.
___ Other factors suggest that native plants at this site are of unusually great importance to food webs or ecological processes located onsite or in the region generally.	#143: .6	___ Other factors suggest that native plants at this site are not atypically important to food webs or ecological processes located onsite or in the region generally.
___ The site is one of only a few, or is one of the largest ones, of its subclass in this estuary that support native tidal vegetation to this degree.	#144: .6	___ Sites of this subclass and size that support characteristic vegetation to this degree are relatively abundant both in this estuary and regionally.
___ In the past, considerable funds have been expended to restore specifically the suitability of this particular site for unusual or characteristic native plant species or associations.	#145: .2	___ In the past, no funds have been expended to restore specifically the suitability of this particular site for native plant species.

.4

Other Factors Potentially Relating to Value or Concern

A potential source of data:

www.coastalatlas.net/metadata/TidalWetlandsofOregonsCoastalWatersheds,Scranton,2004.htm

highest concern	suggested score:	lowest concern
__ Loss of tidal wetlands has been greater in this estuary than in any other on the ~~Oregon~~ AE Coast.	#146: 0.2	__ Loss of tidal wetlands has been less in this estuary than in any other on the ~~Oregon~~ AE Coast.
__ This wetland is the only one of its HGM subclass in this estuary.	#147: 0.8	__ This wetland belongs to an HGM subclass that is the most common one in this estuary.
__ The wetland belongs to an HGM subclass that has experienced the most losses of any tidal HGM subclass in this estuary.	#148: 0.4	__ The wetland belongs to an HGM subclass that has experienced the lowest losses (or greatest gain) of any tidal HGM subclass in this estuary.
__ The entire wetland is designated as a Hazardous Waste Site.	#149: 0.2	___ No portion of the wetland or its immediate tributaries is designated as a Hazardous Waste Site.
__ Much of the wetland is known to contain artifacts of high archaeological importance.	#150: 0.0	__ None of the wetland is known to contain artifacts of high archaeological importance. ? SNCA
__ The wetland is visited by many people engaging in activities that are compatible (in moderation) with its natural functions, e.g., kayaking, educational tours, hunting, fishing, birding.	#151: 0.2	__ The wetland is almost never visited, or is visited to such a large degree that some functions are impaired.

0.3 18

6

ADQ EIS - KODIAK - FAA ADOT 9/11 and 12/07

Functional Assessment for
Buskin River
Devil's Creek 4
TT B

HGM Rapid Assessment Report Data Collection Sheets

The following list and data collection sheets are necessary for completing an HGM Rapid Assessment Report

1) Step 1. Preliminary HGM Classification (Riverine)
2) Step 1 Preliminary HGM Classification (Slope River Proxi.)
3) Step 2. Site Information (completed in the office or field)
4) Step 3. Sketch a Map of Project Assessment Area.
5) Pebble Count & Embeddedness Work Sheet
6) Variable (15) Vegetative Cover (Vvegcov) worksheets.
7) Riverine Variable Scoring Sheet
8) Slope Variable Scoring Sheet
9) Riverine Functional Scoring Sheet
10) Slope Functional Scoring Sheet

(1) Step 1. Preliminary HGM Classification

*Identify, verify, and document the rationale used for recognizing HGM classes and subclasses within the project assessment area. Determine if the assessment area is a **RIVERINE and/or SLOPE RIVER PROXIMAL Wetland Subclass by using the dominant characteristics outlined below.***

Show how the project assessment area satisfies a subclass definition provided in the guidebook by completing the form below. Specifically, include a discussion of the site characteristics and show how they are consistent with the dominant characteristics of the subclass.

Riverine Wetland Dominant Characteristics

CHARACTERISTIC	DESCRIPTION
Hydrologic Source	Unidirectional flow, higher order streams, derived from non-glacial water sources
Vegetation	Any vegetation life form (e.g., trees, shrubs, herbaceous, etc.) that are not in a marine, or estuarine system, nor directly influenced (i.e., actively flooded) by those systems.
Landforms	Occur in valley bottoms, flow predominantly on bedrock, glacial till or glacial marine deposits. Low elevation stream reaches may flow on Pleistocene or Holocene alluvial gravel deposits, or deltaic estuarine deposits raised in elevation by tectonic lift.
Slope	0.001% to ≤ 2.2%
Parent Materials	Upper reaches: exposed bedrock, glacial till, and colluvium over bedrock, alluvial sand, and gravel. Lower reaches: dense basal till, marine lucustrine and glacial fluvial sediments, and alluvial sand and gravel.
Soils	Sand, silt, and gravel deposits with occasional surface organic matter accumulation.

Provide the site Characteristics:

Hydrologic Source: higher order streams & runoff

Vegetation: Riparian veg w/ Willow, Alder, Spruce

Landform, soils: bedrock and alluvial deposits.

Slope: average channel slope is 0.3%

Slope River Proximal Wetland Dominant Characteristics

CHARACTERISTIC	DESCRIPTION
Location	Located within 200 feet of the bankfull of a river channel.
Hydrologic Source	Ground or surface water flow.
Vegetation	Any vegetation life form (e.g., trees, shrubs, herbaceous, etc.) that are not in a marine, or estuarine system nor directly influenced (i.e., actively flooded) by those systems.
Landforms	Occur adjacent to streams and valley sides. Occur in valley bottoms, flow predominantly on bedrock, glacial till or glacial marine deposits. Low elevation stream reaches may flow on Pleistocene or Holocene alluvial gravel deposits, or deltaic estuarine deposits raised in elevation by tectonic lift. **Note**: wetlands in closed depressions are out of the subclass.
Slope	0.1% to ≤25%
Parent Materials	Upper reaches: exposed bedrock, thin till, and colluvium over bedrock. Lower reaches: dense basal till deposited by flowing glacial ice, outwash, gravel.
Soils	Sand, silt, and gravel deposits with occasional surface organic matter accumulation.

Provide the site Characteristics:

Hydrologic Source _____

Vegetation _____

Landform _____

Slope _____

Parent Materials _____

Soils _____

(3) Step 2. Site Information (Completed in the Field or Office)

Dates of Site Visit 9/11 and 9/12/07

Team Members MFR TLJ & RCR

Field Notes/Observations

Collect and review information relevant to the site. This includes, but is not limited to:

- *USGS, state, local, and other maps (at various scales)*
- *Geotechnical, soils, or environmental reports*
- *Correspondence, construction plans on the proposed project*
- *Published literature*

Identify the documents that were collected and reviewed. Include a detailed description of each document (e.g., citation, date, scale, quadrangle name, etc.). If possible, attach copies of each document.

- USGS, state, borough, and other maps (at various scales):
  1. _____
  2. _____
- Air photos and other imagery:
  1. High res. photo from Coast Guard.
  2. _____
- Relevant geotechnical, soils, or environmental reports:
  1. Wetland Delineatn report 1999 Barnes + Moore -
  2. _____
- Correspondence, construction plans, and specifications, etc. on the proposed project:

  _____
- Relevant published literature:

  _____
- Other documents:

- Other Questions:

  Is a cataloged anadromous fish stream adjacent to or part of the assessment area? YES - Buskin River.

  Is the assessment area used by any federally listed threatened or endangered species? Yes Bald Eagal

  Is the assessment area adjacent to a state listed impaired waterbody? ~~Drums Gutch~~ ? NO

  Is the assessment area listed as a historic or cementary?

  Possible histric site WWII an airpat associated at Buskin River Delta -

(4) **Step 3. Sketch a map of Project Assessment Area**

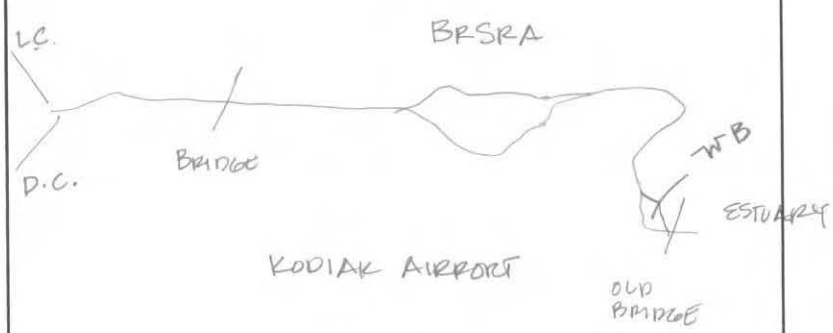


Image source, date, and scale: ______________________

a section of the Buskin River from ~~Chiniak highway~~ to the mouth
Devil's Creek / Louise Creek →
Plus Devils Creek to culvert under ~~bigger~~ runway.

(5) **1) Median Pebble Size D50 (Vpebble-D50):**

sieve analysis

Determine the median pebble size (D50) of the samples by using the Pebble Count Table following the procedure outline above.

Pebble Count & Embeddedness Work sheet ~~[illegible]~~ mm

>2	2-4	5-8	9-16	17-32	33-64	65-128	129-256	257-512	512-1024	> 1024
						/				

Embeddness Work Sheet

0 – 25%	26 – 50%	51 – 75%	76 – 100%
	X		

varies by reach from bedrock to silt + sand.

See section 5.3.6 WR Tech memo.

D.50 = 24 - 37

Vpebble D50 = index = 0.5

Vchanrough = 0.75 ~~[illegible]~~

Vembeddedness = 0.75

(6) 15) Total Vegetative Cover (Vvegcov)

1) Visually estimate the total percent canopy cover by adding each strata (forested, scrub/shrub, herbaceous, and moss and lichen). within 0.1 acre using the PCQ method. For sites dominated by herbaceous vegetation and low shrub vegetation, a line intercept method is used for cover measurements.

Cover Class Midpoints are obtained from the following table:

% Cover	Midpoint
<1	0.5
1-5	3
6-15	10.5
16-25	20.5
26-50	38
51-75	63
76-95	85.5
>95	98

Use the following tables to list the most common species and their estimated percent cover using the cover class midpoint.

Tree Species	Cover Class Midpoint
picea	3
Salix spp.	63
Alnus	10.5
Populus	3
Total Cover	79.5

Small Trees Strata (>3' & <10', single stem)	
Species	**Cover Class Midpoint**
Sambucus	
Total Cover	

Shrubs Strata (multiple stems) and Seedlings (≤3', single stem)	
Species	**Cover Class Midpoint**
Sambucus racemosa	20.5
Rubus spectabelis	63
Total Cover	83.5

Herbaceous Strata: Forbs, Graminoids, Ferns and Fern Allies	
Species	**Cover Class Midpoint**
Lady fern	10.5
Total Cover	

Mosses and Lichens Strata	
Species	**Cover Class Midpoint**
MOSS SPP	85.5
Total Cover	

1. Total percent cover of Moss / Lichen Strata	85.5
2. Total percent cover of Herbaceous Strata	10.5
3. Total percent cover of Shrub Strata	83.5
4. Total percent cover of Tree Strata	79.5
Total Percent Vegetative Cover	259.0

(7) Riverine Variables Scoring Sheet

	Variable	Units of Measurement	Field Measurement	Variable Index Score	
H	**Vpebble-D50**	Median size	29-37	0.5	
H	**Vchanrough**	One Standard Deviation	52-110	0.75	
H	**Vembedded**	% Embedded Pebbles	25-50	0.75	
H	**Vcwpot** Coarse Wood Potential	# of Pieces	>5	1.0	
H	**Vcwin** Coarse Wood in Channel	# of Pieces in Channel	>4 <8 — 0	0.5	
H	**Vlogjams** Number of Logjams	# of Logjams	0	0.1	
H	**Vsubin** Surface water into the A. Area	# of Features	0	0.5	
V	**Vshade** Riparian Shade	% Riparian Shade	20-39 or 81-100?	0.25	
H	**Valthydro** Alteration of Hydroregime	Hydrologic Connections Disturbed	dam @ Prosser Lake?	0.1	
H	**Vbarrier**	Downstream Barriers	0	0.5	seasonal fish view
H	**Vfreq**	# of Features		0.5	
H	**Vstore**	# of Features	1.8	0.5	
B	**Vsoilperm** Soil Permeability	Soil Features	Sandy	1.0	
V	**Vtreeba** Tree Basal Area	Est. of Basal Area		.00	
V	**Vvegcov** Total Veg. Cover	Sum of % of Six (6)		1.00	
V	**Vstrata** Vegetation Strata	# of Veg. Strata		1.00	
L	**Vwetuse** Assessment Area Land use	% of Area Disturbed	100 200	1.00 0.75	
L	**Vwatersheduse** Land use in Watershed	% of Area Disturbed	200	0.75	

(8) Slope Riverine Proximal Variables Scoring Sheet

Variable	Units of Measurement	Field Measurement	Variable Index Score
Vredox Redoximorphic Features	Presence or Absence		
Vacro Acrotelm Layer	Presence & Structure		
Vsoilperm Soil Permeability	Condition of Soil		
Vsource Water Source	% and Category of Observed Land Use		
Vsubout Subsurface Water Flow Out	Evidence of Subsurface Flow		
Vfreq Flood Frequency	Indicators of Frequent Flooding		
Vstore	Ratio of Flood Prone Area		
Vwetuse Assessment Area Land Use	Inches (cm)		
Vadjuse Adjacent Land use	Degree of Slope		
Vmicro Microtopography	Ratio of Observed Angle of Impacted Area		
Vsurwat Surface water	Surface Water		
Vvegcov Total Veg. Cover	# per Site		
Vstrata Vegetation Strata	% Features, Presence of Ponding		
Vgaps Canopy Gaps	Sum of % of Six (6) Vegetation Covers.		
Vtreeba Basal Tree Area	% of Hydrologic Connections Disturbed		
Vdecomp Log Decomposition	% and Category of Observed Land Use		
Vcwslope Coarse Wood	# of Pieces of Coarse Wood		

(9) Riverine Functional Scoring Sheet

Function	Formulae	Functional Capacity Index (FCI)
1) Channel meander Belt Integrity	= (Vwatersheduse + Vwetuse+ Valthydro + Vfreq + Vchanrough + Vcwpot + Vlogjam + Vcwin) / 8	0.59
2) Dynamic Flood Water Retention	= (Vstore + Vpebble-D50 + Vlogjam + Vcwin + Vvegcov) / 5 + (Vwatersheduse + Vfreq) / 3	0.59
3) Nutrient Spiraling	= (Vsubin + Vcwin + Vcwpot + Vchanrough + Vsoilperm + Vwatersheduse + Vshade) / 7	0.68
4) Particulate Retention	= (Vcwin + Vcwpot + Vlogjams + Vtreeba + Vpebble-D50 + Vvegcov) / 6 + (Vfreq) / 2	0.51
5) Removal of Imported Elements and Compounds	= (Valthydro + Vfreq + Vsubin + ~~(Vvegcov + Vtreeba) / 2~~ + Vsoilperm) / 5	0.52
6) In-Channel Biota	= (Vshade + Vchanrough + Vembedded + Vwetuse + Vsubin) / 5	0.65
7) Coarse Wood	= (Vcwin + Vlogjam + Vcwpot) / 3 + Vfreq) / 2	0.52
8) Riparian Vegetation	= (Vfreq + Vwetuse + Vwatersheduse + Vshade + (Vvegcov + Vstrata) / 2 + Vtreeba) / 6	0.58
9) Connectivity and Interspersion	= (Valthydro + Vsubin + Vwetuse + Vwatersheduse + Vbarrier) / 5	0.57

(10) Slope Riverine Proximal Functional Scoring Sheet

Function	Formulae	Functional Capacity Index (FCI)
1) Dynamic Flood Water Retention Capacity	= (Vfreq + Vcwslope + Vsoilperm + Vmicro + Vvegcov +Vstore) / 6	
2) Subsurface Water Retention Capacity	= (Vsource + (Vacro + Vsoilperm + Vdecomp)/ 3 + Vmicro + Vadjuse) / 4	
3) Nutrient Cycling	= (Vadjuse + Vsurwat + Vvegcov + (Vsource + Vsubout) / 2 + (Vacro + Vredox + Vdecomp) / 3) / 5	
4) Organic Carbon Export	= (Vsource + (Vacro + Vsoilperm + Vdecomp + Vredox + Vegcov) / 4+ Vsubout) / 3	
5) Integrity of the Root Zone	= (Vsource +Vsurwat + Vacro + (Vredox + Vsoilperm) / 2) / 4	
6) Maintenance of Wildlife Habitat Structure	= (Vvegcov + Vadjuse +Vwetuse + (Vsurwat + Vmicro) / 2 + Vstrata + (Vgaps + Vcwslope) 2) / 6	
7) Maintenance of Plants	= (Vwetuse + Vvegcov + Vsource + Vtreeba + (Vsurwat + Vacro) / 2 + (Vredox + Vsoilperm) / 2) / 6	

Wetland C

Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of): Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
✓ The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.6	___ None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
___ Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.4	___ Water added from rain events empties quickly from all of the site, via outlets or percolation. This often is evidenced by: ___ lack of flood marks on trees and shrubs ___ scarcity of wetland plants (few FAC or wetter) ___ little or no mottling of soils throughout the seasonally-inundated zone. ___ site is located on slope ___ site is flat (few or no puddles, etc.) ___ presence of outlet channels

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Sediment Stabilization and Phosphorus Retention

Highest Functioning	Suggested Score:	Minimal Functioning
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.6	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
___ Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.2	X Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
___ Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.8	___ All or nearly all of the substrate in the seasonal zone is unvegetated.
___ Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	___ Shallow pools are absent at all times of the year
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	X Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Nitrogen Removal

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if mottling and/or other features that indicate oxygen deficits in soils/ sediments are found in at least part of the site.		
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.6	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
___ Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	✓ No surface water or saturation remains year-round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g., channel or pond, and does not remain for long.
___ Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	X Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
___ Site is burned annually or biennially	.2	___ Site has not been burned in recent years

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning
___ All of the site has vascular plants and/or water with algae.	.6	___ Much of the site is devoid of vascular plants and/or algae.
___ A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	___ Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
___ Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	___ The site is entirely dry during much of the year.
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
___ The site's contributing watershed contains no cropland, paved surface, buildings, or lawns – especially in the parts closest to the site.	.2	___ The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Thermoregulation

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function should be assessed only for riverine sites at which part of the site is permanently inundated and connected by surface water during summer to other water bodies.		
___ Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	___ None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
___ Almost the entire site consists of water deeper than 6 ft.	.2	___ Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Resident Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if part of the site is permanently inundated and the subclass is Riverine Impounding.		
___ Permanent water is extensive, and the site is connected only briefly with associated channels		___ Permanent water is very limited
___ Non-native fish species are absent		___ Non-native species dominate the resident fish component, although some natives are present
___ Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		___ If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		___ Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Anadromous Fish Habitat Support** (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if part of the site is accessible to anadromous fish during seasonal inundation		
___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
___ Floodwaters remain in the site for more than a few days		___ No surface water remains in the site for more than a few days
___Non-native fish species are generally absent		___Non-native fish species predominate
___Substrates suitable for spawning or feeding are extensively present		___ Substrates suitable for spawning or feeding are scarce or absent
___Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		___Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
___Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___Summertime temperature maxima do not exceed preferred range of anadromous fish		___Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Invertebrate Habitat Support**

Highest Functioning	Suggested Score:	Minimal Functioning
___ Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	___ Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
___Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.2	___Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
___Plant forms and species are highly diverse	.2	___ Only one plant form is present, and plant species richness is very low
___ Vegetation is well-interspersed with pools	.4	___ Vegetation and pools (if any) are in 2 separate areas or zones
___Water quality (especially dissolved oxygen) is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	___ Surrounding landscape contains no wetlands or ponds

* Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ site is large relative to its contributing watershed (>4% of total area)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
___ Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs[1] is extensive, and recedes very gradually during the months of January – May [2] (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches). OR: ___ Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs[1]	.4	___ Site never contains surface water OR ___ Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly-submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
___ Bullfrogs and other non-native predators are absent	(0)	___ Bullfrogs and other non-native predators are abundant
___ If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	.4	___ If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
___ There is extensive and varied woody debris in the seasonal zone	0	___ There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
___ Either vegetation and pools are well-interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end.[3] Microtopography is quite varied.	.2	___ Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
___ Suitable basking sites for turtles and calling sites for frogs are present	.2	___ There are no basking sites for turtles or calling sites for frogs
___ Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	___ Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
___ Shorelines are gently sloping	.4	___ Shorelines, if present, are mostly steep
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site
___ Many other wetlands (excluding flowing water) are present nearby	.2	___ There are no other wetlands (excluding flowing water) nearby
___ Water quality is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
___ Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	.2	___ Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

[1] Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

[2] Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

[3] Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	+ (.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) in Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby AND ___ Water depths are predominantly shallow (2 to 24 inches) in April-August*		___ Surface water is present for only a few weeks during April-June, OR ___ Nearly all of the water remains deeper than 6 ft during May-September AND ___ No permanent wetlands are located nearby.
___ Most of the shoreline is not steep		___ Most of the shoreline is steep
___ Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		___ Larger pools, if present, are bordered by only a narrow band of sparse vegetation
___ About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		___ Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
___ Water levels do not abruptly rise a foot or more during April-June		___ Water levels are prone to quickly rise at least 1 foot during April-June
___ A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Busy roads are distant from the site		___ Busy roads border the site
___ Water quality is excellent		___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands or ponds
___ Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.		___ No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
___ Part of the site is visited infrequently in April-June by humans on foot		___ None of the site is visited frequently by humans on foot during April-June

* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support NA (in Airport)

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains extensive surface water during all or most of the fall-winter-spring period		___ The site contains very little surface water during all or most of the fall-winter-spring period
___ Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		___ If forested, water depths during the fall-winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
___ A large portion of the site is inundated only seasonally		___ Of the water that is present, nearly all is present year-round.
___ The acreage of various depth categories is about equal during peak annual inundation		___ A single water depth category predominates.
___ Microtopographic variation (hummocks, puddles, etc.) is extensive		___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ None of the site is visited frequently by humans on foot during September-April.		___ Water is heavily contaminated with pollutants
___ A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
___Water quality is excellent		___ Virtually all of the site is visited frequently by humans on foot during April-June
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands, ponds, or hydric soil.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Some part of the site contains surface water during all (or nearly all) of the year.	.2	___ Surface water is never present at any time of the year.
___ The site contains a large acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	___ Acreage of these is very small.
___ If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) under-canopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	___ If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
___ If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	___ If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.

Runways & Taxiways

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
___ Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.2	___ Only one plant form (tree, shrub, herb) is present
___ If trees are present, many are very old and large, with abundant evidence of regeneration	NA	___ If trees are present, all are young
___ If shrubs are present, all of the significantly present shrub species are natives	NA	___ If shrubs are present, they are comprised of just one species, and it is non-native
___ If herbs are present, all of the significantly present herb species are natives	.6	___ If herbs are present, they are comprised of just one species, and it is non-native
___ Microtopographic relief is great (hummocks, puddles, etc.)	.4	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.4	___ Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.
___ Land cover in the contributing watershed is predominantly "natural"	.2	___ Land cover in the contributing watershed largely contains impervious surface, bare ground, lawns, and row crops.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

Wetland D

Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of): Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
___ The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.6	___ None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
___ Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.4	___ Water added from rain events empties quickly from all of the site, via outlets or percolation. This often is evidenced by: ___ lack of flood marks on trees and shrubs ___ scarcity of wetland plants (few FAC or wetter) ___ little or no mottling of soils throughout the seasonally-inundated zone. ___ site is located on slope ___ site is flat (few or no puddles, etc.) ___ presence of outlet channels

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Sediment Stabilization and Phosphorus Retention

Highest Functioning	Suggested Score:	Minimal Functioning
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.6	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
___ Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.2	___ Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
___ Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.8	___ All or nearly all of the substrate in the seasonal zone is unvegetated.
___ Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	___ Shallow pools are absent at all times of the year
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Nitrogen Removal

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if mottling and/or other features that indicate oxygen deficits in soils/ sediments are found in at least part of the site.		
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.6	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
___ Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	___ No surface water or saturation remains year-round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g., channel or pond, and does not remain for long.
___ Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	___ Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
___ Site is burned annually or biennially	.2	___ Site has not been burned in recent years

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning
___ All of the site has vascular plants and/or water with algae.	.6	___ Much of the site is devoid of vascular plants and/or algae.
___ A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	___ Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
___ Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	___ The site is entirely dry during much of the year.
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
___ The site's contributing watershed contains no cropland, paved surface, buildings, or lawns – especially in the parts closest to the site.	.2	___ The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Thermoregulation

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function should be assessed only for riverine sites at which part of the site is permanently inundated and connected by surface water during summer to other water bodies.		
___ Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	___ None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
___ Almost the entire site consists of water deeper than 6 ft.	.2	___ Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Resident Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if part of the site is permanently inundated and the subclass is Riverine Impounding.		
___ Permanent water is extensive, and the site is connected only briefly with associated channels		___ Permanent water is very limited
___ Non-native fish species are absent		___ Non-native species dominate the resident fish component, although some natives are present
___ Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		___ If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		___ Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Anadromous Fish Habitat Support (NA)

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if part of the site is accessible to anadromous fish during seasonal inundation		
___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
___ Floodwaters remain in the site for more than a few days		___ No surface water remains in the site for more than a few days
___ Non-native fish species are generally absent		___ Non-native fish species predominate
___ Substrates suitable for spawning or feeding are extensively present		___ Substrates suitable for spawning or feeding are scarce or absent
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		___ Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Summertime temperature maxima do not exceed preferred range of anadromous fish		___ Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	___ Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
___ Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.2	___ Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
___ Plant forms and species are highly diverse	.2	___ Only one plant form is present, and plant species richness is very low
___ Vegetation is well-interspersed with pools	.4	___ Vegetation and pools (if any) are in 2 separate areas or zones
___ Water quality (especially dissolved oxygen) is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	___ Surrounding landscape contains no wetlands or ponds

* Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ site is large relative to its contributing watershed (>4% of total area)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
___ Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs[1] is extensive, and recedes very gradually during the months of January – May[2] (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches). OR: ___ Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs[1]	.4	___ Site never contains surface water OR ___ Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly-submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
___ Bullfrogs and other non-native predators are absent	0	___ Bullfrogs and other non-native predators are abundant
___ If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	.4	___ If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
___ There is extensive and varied woody debris in the seasonal zone	0	___ There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
___ Either vegetation and pools are well-interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end.[3] Microtopography is quite varied.	.2	___ Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
___ Suitable basking sites for turtles and calling sites for frogs are present	.2	___ There are no basking sites for turtles or calling sites for frogs
___ Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	___ Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
___ Shorelines are gently sloping	.4	___ Shorelines, if present, are mostly steep
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site
___ Many other wetlands (excluding flowing water) are present nearby	.2	___ There are no other wetlands (excluding flowing water) nearby
___ Water quality is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
___ Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	.2	___ Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

[1] Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

[2] Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

[3] Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby AND ___ Water depths are predominantly shallow (2 to 24 inches) in April-August*		___ Surface water is present for only a few weeks during April-June, OR ___ Nearly all of the water remains deeper than 6 ft during May-September AND ___ No permanent wetlands are located nearby.
___ Most of the shoreline is not steep		___ Most of the shoreline is steep
___ Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		___ Larger pools, if present, are bordered by only a narrow band of sparse vegetation
___ About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		___ Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
___ Water levels do not abruptly rise a foot or more during April-June		___ Water levels are prone to quickly rise at least 1 foot during April-June
___ A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Busy roads are distant from the site		___ Busy roads border the site
___ Water quality is excellent		___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands or ponds
___ Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.		___ No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
___ Part of the site is visited infrequently in April-June by humans on foot		___ None of the site is visited frequently by humans on foot during April-June

* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains extensive surface water during all or most of the fall-winter-spring period		___ The site contains very little surface water during all or most of the fall-winter-spring period
___ Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		___ If forested, water depths during the fall-winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
___ A large portion of the site is inundated only seasonally		___ Of the water that is present, nearly all is present year-round.
___ The acreage of various depth categories is about equal during peak annual inundation		___ A single water depth category predominates.
___ Microtopographic variation (hummocks, puddles, etc.) is extensive		___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ None of the site is visited frequently by humans on foot during September-April.		___ Water is heavily contaminated with pollutants
___ A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
___Water quality is excellent		___ Virtually all of the site is visited frequently by humans on foot during April-June
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands, ponds, or hydric soil.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Some part of the site contains surface water during all (or nearly all) of the year.	.2	___ Surface water is never present at any time of the year.
___ The site contains a large acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	___ Acreage of these is very small.
___ If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) under-canopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	___ If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
___ If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	___ If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
___ Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.2	___ Only one plant form (tree, shrub, herb) is present
___ If trees are present, many are very old and large, with abundant evidence of regeneration	NA	___ If trees are present, all are young
___ If shrubs are present, all of the significantly present shrub species are natives	NA	___ If shrubs are present, they are comprised of just one species, and it is non-native
___ If herbs are present, all of the significantly present herb species are natives	.4	___ If herbs are present, they are comprised of just one species, and it is non-native
___ Microtopographic relief is great (hummocks, puddles, etc.)	.4	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.4	___ Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.
___ Land cover in the contributing watershed is predominantly "natural"	.2	___ Land cover in the contributing watershed largely contains impervious surface, bare ground, lawns, and row crops.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

Wetland E

Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of): **Water Storage and Delay**

Highest Functioning	Suggested Score:	Minimal Functioning
___ The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.4	___ None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
___ Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.2	___ Water added from rain events empties quickly from all of the site, via outlets or percolation. This often is evidenced by: ___ lack of flood marks on trees and shrubs ___ scarcity of wetland plants (few FAC or wetter) ___ little or no mottling of soils throughout the seasonally-inundated zone. ___ site is located on slope ___ site is flat (few or no puddles, etc.) ___ presence of outlet channels

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Sediment Stabilization and Phosphorus Retention

Highest Functioning	Suggested Score:	Minimal Functioning
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.4	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
___ Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.2	___ Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
___ Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.2	___ All or nearly all of the substrate in the seasonal zone is unvegetated.
___ Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	___ Shallow pools are absent at all times of the year
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Nitrogen Removal

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if mottling and/or other features that indicate oxygen deficits in soils/ sediments are found in at least part of the site.		
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.4	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
___ Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	___ No surface water or saturation remains year-round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g., channel or pond, and does not remain for long.
___ Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	___ Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
___ Site is burned annually or biennially	.2	___ Site has not been burned in recent years

Your Judgments:
Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning
___ All of the site has vascular plants and/or water with algae.	.4	___ Much of the site is devoid of vascular plants and/or algae.
___ A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	___ Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
___ Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	___ The site is entirely dry during much of the year.
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
___ The site's contributing watershed contains no cropland, paved surface, buildings, or lawns – especially in the parts closest to the site.	.2	___ The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:
Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Thermoregulation

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function should be assessed only for riverine sites at which part of the site is permanently inundated and connected by surface water during summer to other water bodies.		
___ Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	___ None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
___ Almost the entire site consists of water deeper than 6 ft.	.2	___ Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Resident Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if part of the site is permanently inundated and the subclass is Riverine Impounding.		
___ Permanent water is extensive, and the site is connected only briefly with associated channels		___ Permanent water is very limited
___ Non-native fish species are absent		___ Non-native species dominate the resident fish component, although some natives are present
___ Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		___ If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		___ Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): Anadromous Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if part of the site is accessible to anadromous fish during seasonal inundation		
___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
___ Floodwaters remain in the site for more than a few days		___ No surface water remains in the site for more than a few days
___Non-native fish species are generally absent		___Non-native fish species predominate
___Substrates suitable for spawning or feeding are extensively present		___ Substrates suitable for spawning or feeding are scarce or absent
___Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		___Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
___Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___Summertime temperature maxima do not exceed preferred range of anadromous fish		___Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): Invertebrate Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	___ Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
___Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.2	___Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
___Plant forms and species are highly diverse	.2	___Only one plant form is present, and plant species richness is very low
___ Vegetation is well-interspersed with pools	.4	___ Vegetation and pools (if any) are in 2 separate areas or zones
___Water quality (especially dissolved oxygen) is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	___ Surrounding landscape contains no wetlands or ponds

* Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ site is large relative to its contributing watershed (>4% of total area)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
___ Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs[1] is extensive, and recedes very gradually during the months of January – May [2] (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches). OR: ___ Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs[1]	.2	___ Site never contains surface water OR ___ Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly-submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
___ Bullfrogs and other non-native predators are absent	(0)	___ Bullfrogs and other non-native predators are abundant
___ If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	.2	___ If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
___ There is extensive and varied woody debris in the seasonal zone	0	___ There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
___ Either vegetation and pools are well-interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end.[3] Microtopography is quite varied.	.2	___ Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
___ Suitable basking sites for turtles and calling sites for frogs are present	.2	___ There are no basking sites for turtles or calling sites for frogs
___ Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	___ Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
___ Shorelines are gently sloping	.2	___ Shorelines, if present, are mostly steep
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site
___ Many other wetlands (excluding flowing water) are present nearby	.2	___ There are no other wetlands (excluding flowing water) nearby
___ Water quality is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
___ Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	.2	___ Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

[1] Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

[2] Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

[3] Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) in Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby AND ___ Water depths are predominantly shallow (2 to 24 inches) in April-August*		___ Surface water is present for only a few weeks during April-June, OR ___ Nearly all of the water remains deeper than 6 ft during May-September AND ___ No permanent wetlands are located nearby.
___ Most of the shoreline is not steep		___ Most of the shoreline is steep
___ Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		___ Larger pools, if present, are bordered by only a narrow band of sparse vegetation
___ About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		___ Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
___ Water levels do not abruptly rise a foot or more during April-June		___ Water levels are prone to quickly rise at least 1 foot during April-June
___ A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Busy roads are distant from the site		___ Busy roads border the site
___ Water quality is excellent		___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands or ponds
___ Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.		___ No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
___ Part of the site is visited infrequently in April-June by humans on foot		___ None of the site is visited frequently by humans on foot during April-June

* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) in Airpnt

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains extensive surface water during all or most of the fall-winter-spring period		___ The site contains very little surface water during all or most of the fall-winter-spring period
___ Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		___ If forested, water depths during the fall-winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
___ A large portion of the site is inundated only seasonally		___ Of the water that is present, nearly all is present year-round.
___ The acreage of various depth categories is about equal during peak annual inundation		___ A single water depth category predominates.
___ Microtopographic variation (hummocks, puddles, etc.) is extensive		___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ None of the site is visited frequently by humans on foot during September-April.		___ Water is heavily contaminated with pollutants
___ A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
___Water quality is excellent		___ Virtually all of the site is visited frequently by humans on foot during April-June
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands, ponds, or hydric soil.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Some part of the site contains surface water during all (or nearly all) of the year.	.2	___ Surface water is never present at any time of the year.
___ The site contains a large acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	___ Acreage of these is very small.
___ If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) under-canopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	___ If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
___ If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	___ If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
___ Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.2	___ Only one plant form (tree, shrub, herb) is present
___ If trees are present, many are very old and large, with abundant evidence of regeneration	NA	___ If trees are present, all are young
___ If shrubs are present, all of the significantly present shrub species are natives	NA	___ If shrubs are present, they are comprised of just one species, and it is non-native
___ If herbs are present, all of the significantly present herb species are natives	.4	___ If herbs are present, they are comprised of just one species, and it is non-native
___ Microtopographic relief is great (hummocks, puddles, etc.)	.4	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.2	___ Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.
___ Land cover in the contributing watershed is predominantly "natural"	.2	___ Land cover in the contributing watershed largely contains impervious surface, bare ground, lawns, and row crops.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

Wetland F

Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of): Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
___ The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.4	___ None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
___ Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.4	___ Water added from rain events empties quickly from all of the site, via outlets or percolation. This often is evidenced by: ___ lack of flood marks on trees and shrubs ___ scarcity of wetland plants (few FAC or wetter) ___ little or no mottling of soils throughout the seasonally-inundated zone. ___ site is located on slope ___ site is flat (few or no puddles, etc.) ___ presence of outlet channels

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Sediment Stabilization and Phosphorus Retention**

Highest Functioning	Suggested Score:	Minimal Functioning
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.4	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
___ Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.6	___ Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
___ Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.6	___ All or nearly all of the substrate in the seasonal zone is unvegetated.
___ Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.6	___ Shallow pools are absent at all times of the year
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.4	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Nitrogen Removal**

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if mottling and/or other features that indicate oxygen deficits in soils/ sediments are found in at least part of the site.		
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.4	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
___ Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	___ No surface water or saturation remains year-round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g., channel or pond, and does not remain for long.
___ Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.6	___ Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.4	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
___ Site is burned annually or biennially	.2	___ Site has not been burned in recent years

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning
___ All of the site has vascular plants and/or water with algae.	.4	___ Much of the site is devoid of vascular plants and/or algae.
___ A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.2	___ Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
___ Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	___ The site is entirely dry during much of the year.
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.4	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
___ The site's contributing watershed contains no cropland, paved surface, buildings, or lawns – especially in the parts closest to the site.	.2	___ The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Thermoregulation

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function should be assessed only for riverine sites at which part of the site is permanently inundated and connected by surface water during summer to other water bodies.		
___ Entire water surface in summer is shaded by a closed tree canopy or by topography.	.2	___ None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
___ Almost the entire site consists of water deeper than 6 ft.	.2	___ Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Resident Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if part of the site is permanently inundated and the subclass is Riverine Impounding.		
___ Permanent water is extensive, and the site is connected only briefly with associated channels		___ Permanent water is very limited
___ Non-native fish species are absent		___ Non-native species dominate the resident fish component, although some natives are present
___ Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		___ If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		___ Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Anadromous Fish Habitat Support** NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if part of the site is accessible to anadromous fish during seasonal inundation		
___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
___ Floodwaters remain in the site for more than a few days		___ No surface water remains in the site for more than a few days
___ Non-native fish species are generally absent		___ Non-native fish species predominate
___ Substrates suitable for spawning or feeding are extensively present		___ Substrates suitable for spawning or feeding are scarce or absent
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		___ Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Summertime temperature maxima do not exceed preferred range of anadromous fish		___ Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Invertebrate Habitat Support**

Highest Functioning	Suggested Score:	Minimal Functioning
___ Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.6	___ Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
___ Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.4	___ Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
___ Plant forms and species are highly diverse	.4	___ Only one plant form is present, and plant species richness is very low
___ Vegetation is well-interspersed with pools	.6	___ Vegetation and pools (if any) are in 2 separate areas or zones
___ Water quality (especially dissolved oxygen) is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.4	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	___ Surrounding landscape contains no wetlands or ponds

* Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ site is large relative to its contributing watershed (>4% of total area)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Amphibian & Turtle Habitat**

Highest Functioning	Suggested Score:	Minimal Functioning
___ Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs[1] is extensive, and recedes very gradually during the months of January – May [2] (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches). OR: ___ Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs[1]	.4	___ Site never contains surface water OR ___ Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly-submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
___ Bullfrogs and other non-native predators are absent	(0)	___ Bullfrogs and other non-native predators are abundant
___ If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	.4	___ If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
___ There is extensive and varied woody debris in the seasonal zone	.2	___ There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
___ Either vegetation and pools are well-interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end.[3] Microtopography is quite varied.	.4	___ Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
___ Suitable basking sites for turtles and calling sites for frogs are present	.2	___ There are no basking sites for turtles or calling sites for frogs
___ Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	___ Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
___ Shorelines are gently sloping	.4	___ Shorelines, if present, are mostly steep
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site
___ Many other wetlands (excluding flowing water) are present nearby	.2	___ There are no other wetlands (excluding flowing water) nearby
___ Water quality is excellent	.2	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.4	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
___ Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	.4	___ Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

[1] Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

[2] Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

[3] Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby AND ___ Water depths are predominantly shallow (2 to 24 inches) in April-August*		___ Surface water is present for only a few weeks during April-June, OR ___ Nearly all of the water remains deeper than 6 ft during May-September AND ___ No permanent wetlands are located nearby.
___ Most of the shoreline is not steep		___ Most of the shoreline is steep
___ Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		___ Larger pools, if present, are bordered by only a narrow band of sparse vegetation
___ About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		___ Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
___ Water levels do not abruptly rise a foot or more during April-June		___ Water levels are prone to quickly rise at least 1 foot during April-June
___ A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Busy roads are distant from the site		___ Busy roads border the site
___ Water quality is excellent		___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands or ponds
___ Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.		___ No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
___ Part of the site is visited infrequently in April-June by humans on foot		___ None of the site is visited frequently by humans on foot during April-June

* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains extensive surface water during all or most of the fall-winter-spring period		___ The site contains very little surface water during all or most of the fall-winter-spring period
___ Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		___ If forested, water depths during the fall-winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
___ A large portion of the site is inundated only seasonally		___ Of the water that is present, nearly all is present year-round.
___ The acreage of various depth categories is about equal during peak annual inundation		___ A single water depth category predominates.
___ Microtopographic variation (hummocks, puddles, etc.) is extensive		___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ None of the site is visited frequently by humans on foot during September-April.		___ Water is heavily contaminated with pollutants
___ A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
___Water quality is excellent		___ Virtually all of the site is visited frequently by humans on foot during April-June
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands, ponds, or hydric soil.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Some part of the site contains surface water during all (or nearly all) of the year.	.4	___ Surface water is never present at any time of the year.
___ The site contains a large acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	___ Acreage of these is very small.
___ If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) under-canopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	___ If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
___ If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.2	___ If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
___ Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.2	___ Only one plant form (tree, shrub, herb) is present
___ If trees are present, many are very old and large, with abundant evidence of regeneration	NA	___ If trees are present, all are young
___ If shrubs are present, all of the significantly present shrub species are natives	NA	___ If shrubs are present, they are comprised of just one species, and it is non-native
___ If herbs are present, all of the significantly present herb species are natives	.4	___ If herbs are present, they are comprised of just one species, and it is non-native
___ Microtopographic relief is great (hummocks, puddles, etc.)	.4	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.4	___ Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.
___ Land cover in the contributing watershed is predominantly "natural"	.2	___ Land cover in the contributing watershed largely contains impervious surface, bare ground, lawns, and row crops.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.

Wetland G

Appendix B. Assessment of Function Capacity: Judgmental Method

Complete the following "qualitative assessments" of function only if you chose not to complete the reference-based assessments" that began on page 20.

Instructions: In each row, indicate with a checkmark if your site looks more like the "highest capacity" condition or the "minimal capacity" condition. Then circle a number on the scoring line below this table, based on your overall impression of the site's capacity to support this function. Alternatively, instead of checkmarks, you can assign a score to each row by placing a number in the center column of each row, e.g., 0 (minimal capacity) -to- 1.0 (highest capacity), and then combine the row scores in a manner of your choosing, perhaps weighting some rows more than others if you believe those indicators to have greater influence on a function. Whether based on mathematical operations or another way of synthesizing, be sure to circle your final score for the function on either or both of the shaded "Judgment Lines" at the bottom. Definitions of many of the terms are provided in Appendix A.

Function Capacity (Judgmental Assessment of): Water Storage and Delay

Highest Functioning	Suggested Score:	Minimal Functioning
___ The proportion of the site that is inundated only seasonally is large. The seasonally-inundated parts are defined by flood marks on trees and shrubs, stunted plants, and/or distinctive assemblages of plant species.	.4	___ None of the site is inundated only seasonally. The site is always comprised only of permanent water or a high water table without surface water.
___ Most of the surface water in the seasonally-inundated zone remains for a few days after each rain event, but not less or more.	.2	___ Water added from rain events empties quickly from all of the site, via outlets or percolation. This often is evidenced by: ___ lack of flood marks on trees and shrubs ___ scarcity of wetland plants (few FAC or wetter) ___ little or no mottling of soils throughout the seasonally-inundated zone. ___ site is located on slope ___ site is flat (few or no puddles, etc.) ___ presence of outlet channels

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Sediment Stabilization and Phosphorus Retention**

Highest Functioning	Suggested Score:	Minimal Functioning
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, deep, extensive).	.4	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate).
___ Texture of the predominant substrate in the upper 12 inches of the seasonal zone is mostly clay, silty clay, sandy clay, clay loam, or native organic. See p. 83 for key to soil textures.	.2	___ Upper 12 inches of the predominant substrate in the seasonal zone is mostly sand or gravel.
___ Herbs, shrubs, and/or vines together always occupy a large percent of the ground cover in the seasonal zone. Very little soil is bare.	.2	___ All or nearly all of the substrate in the seasonal zone is unvegetated.
___ Shallow pools and puddles are present and well-interspersed with herbaceous vegetation	.8	___ Shallow pools are absent at all times of the year
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, plowing, disking, leveling. Extensive evidence of severe scour or erosion may be present within the site. No sediment marks on trees or other plants.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ The substrate is uniformly flat, with no noticeable microtopography (no hummocks, etc.)

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Nitrogen Removal**

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if mottling and/or other features that indicate oxygen deficits in soils/ sediments are found in at least part of the site.		
___ High score was assigned to Water Storage & Delay function (inundation is long, frequent, extensive)	.4	___ Low score was assigned to Water Storage & Delay function (water levels barely fluctuate)
___ Some surface water or saturation remains year-round or nearly so, and is dispersed around the site such that water flow paths and residence times are long.	.2	___ No surface water or saturation remains year-round. If seasonal flooding occurs, the surface water is concentrated in one part of the site, e.g., channel or pond, and does not remain for long.
___ Soil microbial processes are fairly mature, as possibly suggested by abundance of dead wood, thick and extensive soil organic layer, and many large-diameter trees	.2	___ Soil microbial processes are not well-developed, as possibly suggested by lack of dead wood, thick soil organic layer, and/or large-diameter trees

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site. None of the site was constructed from upland.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling.
___ Most of the site has complex microtopography (hummocks, puddles, etc.)	.2	___ Most of the site has no noticeable microtopography (no hummocks, puddles, etc.)
___ Site is burned annually or biennially	.2	___ Site has not been burned in recent years

Your Judgments:
Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Primary Production

Highest Functioning	Suggested Score:	Minimal Functioning
___ All of the site has vascular plants and/or water with algae.	.4	___ Much of the site is devoid of vascular plants and/or algae.
___ A variety of plant forms is present in about equal proportions (trees, shrubs, and herbs) and is well-distributed throughout the site	.6	___ Whatever plants are present are mainly of a single form (trees, shrubs, or herbs)
___ Some shallow (<3 ft) surface water remains year-round or nearly so, and in summer is dispersed around the site, e.g., many puddles	.2	___ The site is entirely dry during much of the year.
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling. Severe erosion may be evident within the site.
___ The site's contributing watershed contains no cropland, paved surface, buildings, or lawns – especially in the parts closest to the site.	.2	___ The site's contributing watershed is almost entirely cropland, paved surface, buildings, and lawns – especially the parts closest to the site.

Your Judgments:
Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Thermoregulation

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function should be assessed only for riverine sites at which part of the site is permanently inundated and connected by surface water during summer to other water bodies.		
___ Entire water surface in summer is shaded by a closed tree canopy or by topography.	.6	___ None of the water is shaded by vegetation or topography, and all of the water is shallower than 2m during summer.
___ Almost the entire site consists of water deeper than 6 ft.	.2	___ Very little of the site contains permanent water, and it never is deeper than a few inches.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Resident Fish Habitat Support NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: This function may be assessed only if part of the site is permanently inundated and the subclass is Riverine Impounding.		
___ Permanent water is extensive, and the site is connected only briefly with associated channels		___ Permanent water is very limited
___ Non-native fish species are absent		___ Non-native species dominate the resident fish component, although some natives are present
___ Shallow water area and proportion of the site that is inundated only seasonally is of sufficient extent and quality to support spawning by most species, and supports high densities of aquatic invertebrates		___ If present, shorelines are steep, dropping sharply into water deeper than 6 ft., with little or no seasonal zone being present
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides year-round shelter from predation is abundant		___ Where water is present seasonally, cover that could shelter fish from predation is scarce or lacking.
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Anadromous Fish Habitat Support** NA

Highest Functioning	Suggested Score:	Minimal Functioning
Note: Proceed with assessing this function only if part of the site is accessible to anadromous fish during seasonal inundation		
___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth		___ Floodwaters spill into the site across a broad bank or through a wide (unconstricted) mouth
___ Floodwaters remain in the site for more than a few days		___ No surface water remains in the site for more than a few days
___ Non-native fish species are generally absent		___ Non-native fish species predominate
___ Substrates suitable for spawning or feeding are extensively present		___ Substrates suitable for spawning or feeding are scarce or absent
___ Cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from currents and predators is abundant, at least in the seasonal zone		___ Cover that provides shelter from currents and predators is scarce or lacking from all parts of the site
___ Water quality (especially dissolved oxygen) is excellent		___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Summertime temperature maxima do not exceed preferred range of anadromous fish		___ Summertime temperature maxima exceed limits lethal to anadromous fish

Your Judgments:

Function Capacity score = _____ or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of): **Invertebrate Habitat Support**

Highest Functioning	Suggested Score:	Minimal Functioning
___ Surface water is permanent or nearly permanent, AND all of the water is shallower than 2 feet during May-September*	.2	___ Surface water is present only briefly (RI sites) or not at all (SF sites), OR nearly all of the water remains deeper than 6 ft during May-September
___ Cover (especially aquatic plants, woody debris) that supports algae and provides shelter from currents and predators is abundant in both the seasonal and permanent zone	.2	___ Cover (aquatic plants, woody debris.) that could support algae and provide shelter from currents and predators is lacking
___ Plant forms and species are highly diverse	.6	___ Only one plant form is present, and plant species richness is very low
___ Vegetation is well-interspersed with pools	.4	___ Vegetation and pools (if any) are in 2 separate areas or zones
___ Water quality (especially dissolved oxygen) is excellent	.4	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits

Highest Functioning	Suggested Score:	Minimal Functioning
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the site was entirely constructed from upland.
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.	.2	___ Surrounding landscape contains no wetlands or ponds

* Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ site is large relative to its contributing watershed (>4% of total area)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Amphibian & Turtle Habitat

Highest Functioning	Suggested Score:	Minimal Functioning
___ Permanent water is absent, but shallow surface water that contains extensive partly-submerged fine-stemmed herbs[1] is extensive, and recedes very gradually during the months of January – May [2] (i.e., during this period, there are at least 30 days when water levels are stable or have a vertical fluctuation of <2 inches). OR: ___ Permanent water is extensive and contains (a) abundant underwater cover (aquatic plants, logs, boulders, overhanging trees, deep water spots, etc.) that provides shelter from predation, and (b) partly-submerged fine-stemmed herbs[1]	.2	___ Site never contains surface water OR ___ Site is entirely surface water, which either (a) never fluctuates vertically (i.e., no seasonal zone is present), or (b) fluctuates too much – more than 2 inches during all 10-day periods, or (c) is devoid of any emergent herbs that are partly-submerged during the springtime, or (d) flows faster than 4 inches/second during the entire springtime, everywhere in the site, or (e) is mostly deeper than 40 inches and is bordered by a shoreline with a very steep slope
___ Bullfrogs and other non-native predators are absent	0	___ Bullfrogs and other non-native predators are abundant
___ If surface water everywhere in the site is flowing during springtime, there are at least 30 days when current velocities are slow (<4 inches/second)	.2	___ If surface water everywhere in the site is flowing during springtime, there are never more than 30 days when current velocities are slow (<4 inches/second)
___ There is extensive and varied woody debris in the seasonal zone	0	___ There is no woody debris in the seasonal zone

Highest Functioning	Suggested Score:	Minimal Functioning
___ Either vegetation and pools are well-interspersed during high water level, or any woody vegetation bordering the larger pools is located mostly on their north end.[3] Microtopography is quite varied.	.2	___ Vegetation and pools are in separate areas of the site during high water level, and any woody vegetation bordering the larger pools is located mostly on their south end. Microtopography is too flat to allow many puddles to form (no hummocks, etc.)
___ Suitable basking sites for turtles and calling sites for frogs are present	.2	___ There are no basking sites for turtles or calling sites for frogs
___ Land cover in adjoining uplands is a mix of natural grassland and woodland; woodlands have extensive and varied woody debris	.2	___ Land cover in adjoining uplands largely contains impervious surface, bare ground, lawns, and row crops
___ Shorelines are gently sloping	.2	___ Shorelines, if present, are mostly steep
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site
___ Many other wetlands (excluding flowing water) are present nearby	.2	___ There are no other wetlands (excluding flowing water) nearby
___ Water quality is excellent	.4	___ Water is heavily contaminated with pollutants, and/or experiences severe and prolonged oxygen deficits
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling. No evidence of severe erosion within the site.	.2	___ Substrates throughout the entire site have recently been recontoured or otherwise subjected to compaction, excavation, or leveling, or the entire site was constructed from upland.
___ Soils and submerged sediments contain a moderately thick organic layer (leaf litter, peat, decomposed organics, etc.)	.2	___ Soils and submerged sediments contain no organic layer, and are mostly hard-packed clay; or organic layer is so thick that water is chronically anoxic.

[1] Emergent herbs with stem diameter of <3 mm (measured 2 inches below springtime water surface); this includes nearly all perennial herbs except cattail.

[2] Areas likely to retain water well into the growing season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

During the January-May period, 30 days of stable water levels are required for some aquatic amphibian eggs to mature, and during this time fluctuations of greater than 2 inches are lethal (Richter 1997).

[3] Vegetation located north of pools is less likely to block sunlight important to developing aquatic amphibians (Richter 1997).

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Breeding Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains many acres of permanent or nearly permanent surface water, or a large permanent wetland (excluding streams) is located nearby AND ___ Water depths are predominantly shallow (2 to 24 inches) in April-August*		___ Surface water is present for only a few weeks during April-June, OR ___ Nearly all of the water remains deeper than 6 ft during May-September AND ___ No permanent wetlands are located nearby.
___ Most of the shoreline is not steep		___ Most of the shoreline is steep
___ Larger pools of water are bordered by a wide, dense band of tall herbs and/or shrubs in April-August.		___ Larger pools, if present, are bordered by only a narrow band of sparse vegetation
___ About equal proportions of water and vegetation are present, and are well-interspersed during the April – August period		___ Vegetation and pools (if any) are in 2 separate areas or zones, not interspersed
___ Water levels do not abruptly rise a foot or more during April-June		___ Water levels are prone to quickly rise at least 1 foot during April-June
___ A large variety of herbs is present; the site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover is mostly comprised of one or a few non-native or highly invasive native species
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Busy roads are distant from the site		___ Busy roads border the site
___ Water quality is excellent		___ Water is heavily contaminated with pollutants
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Surrounding landscape contains large acreage of wetlands, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands or ponds
___ Nest boxes, nest platforms, and other artificial structures intended to assist waterbird nesting are extensive and are regularly maintained.		___ No nest boxes, nest platforms, or other artificial structures intended to assist waterbird nesting are present, or they aren't well-maintained.
___ Part of the site is visited infrequently in April-June by humans on foot		___ None of the site is visited frequently by humans on foot during April-June

* Areas likely to retain water well into the waterbird breeding season may have many of these characteristics:

___ prevalence of wetland plants (FAC or wetter, and especially OBL)
___ intensive mottling & gleying of soils throughout most of the seasonally-inundated zone
___ site is located in flatland terrain (not on slopes)
___ extensive microtopographic variation (many hummocks, puddles, etc.)
___ absence of outlet channels, and/or site is managed for water storage.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Wintering & Migratory Waterbird Support (NA) Airport

Highest Functioning	Suggested Score:	Minimal Functioning
___ The site contains extensive surface water during all or most of the fall-winter-spring period		___ The site contains very little surface water during all or most of the fall-winter-spring period
___ Water depths in most of the site during most of the fall-winter-spring period are shallow (<24 inches)		___ If forested, water depths during the fall-winter-spring period are always shallower than 24 inches in all of the site (shallower depths are permissible then in unforested wetlands).
___ A large portion of the site is inundated only seasonally		___ Of the water that is present, nearly all is present year-round.
___ The acreage of various depth categories is about equal during peak annual inundation		___ A single water depth category predominates.
___ Microtopographic variation (hummocks, puddles, etc.) is extensive		___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ None of the site is visited frequently by humans on foot during September-April.		___ Water is heavily contaminated with pollutants
___ A large variety of herbs is present. The site is actively managed to control the spread of non-native or invasive species		___ Vegetation cover (except in farmed wetlands) is mostly comprised of one or a few non-native or highly invasive native species
___Water quality is excellent		___ Virtually all of the site is visited frequently by humans on foot during April-June
___ Substrates have never been recontoured or otherwise subjected to compaction, excavation, or leveling.		___ Substrates have recently been recontoured or otherwise subjected to compaction, excavation, or leveling (unless such activities were done in connection with restoring a site to its historical condition)
___ Land cover in surrounding buffer zones is mainly a mix of natural grassland, woodland, agricultural lands, and water		___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ Surrounding landscape contains large acreage of hydric soil, wetlands, and water, including some with a different water regime than the assessed site.		___ Surrounding landscape contains no wetlands, ponds, or hydric soil.

Your Judgments:

Function Capacity score = _____. or circle one of the following:

1.0	.8	.6	.4	.2	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Songbird Habitat Support

Highest Functioning	Suggested Score:	Minimal Functioning
___ Some part of the site contains surface water during all (or nearly all) of the year.	.2	___ Surface water is never present at any time of the year.
___ The site contains a large acreage of closed-canopy forest, native shrubland, wet prairie, and/or emergent wetland.	.2	___ Acreage of these is very small.
___ If the site is mostly native shrubland and/or forest, then (a) large-diameter trees are numerous, (b) snags of various sizes are abundant, (c) under-canopy shrub cover is extensive, and (d) a large variety of trees, shrubs and vines is present.	NA	___ If the site is mostly shrubland and/or forest, then (a) trees are very small, (b) snags are absent, (c) under-canopy shrub cover is lacking, and (d) the variety of trees, shrubs, and vines is small, and comprised almost entirely of non-native species.
___ If the site is mostly wet prairie and/or emergent wetland, then (a) a large variety of herbs is present, (b) the site is actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are concentrated in one or a few parts of the site.	.6	___ If the site is mostly prairie and/or emergent wetland, then (a) the variety of herbs is small, (b) the site is not actively managed to control the spread of non-native or invasive herb species, (c) trees and shrubs, if present, are scattered widely throughout the site.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer zones largely contains impervious surface, bare ground, lawns, and row crops.
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	.4	(.2)	0
Highest					Lowest

Function Capacity (Judgmental Assessment of):
Support of Characteristic Vegetation

Highest Functioning	Suggested Score:	Minimal Functioning
___ Trees, shrubs, and herbs are all present, and are well-interspersed throughout the site	.6	___ Only one plant form (tree, shrub, herb) is present
___ If trees are present, many are very old and large, with abundant evidence of regeneration	NA	___ If trees are present, all are young
___ If shrubs are present, all of the significantly present shrub species are natives	.6	___ If shrubs are present, they are comprised of just one species, and it is non-native
___ If herbs are present, all of the significantly present herb species are natives	.6	___ If herbs are present, they are comprised of just one species, and it is non-native
___ Microtopographic relief is great (hummocks, puddles, etc.)	.2	___ The substrate is very flat, essentially prohibiting the formation of puddles.
___ Springtime surface water levels drop very slowly (< 2 vertical inches per 30 days, average)	.2	___ Springtime water levels fluctuate or drop rapidly (>2 inches per 10 days, average)

Highest Functioning	Suggested Score:	Minimal Functioning
___ None of the site is visited frequently by humans on foot	.2	___ Every part of the site is visited frequently by humans on foot
___ Busy roads are distant from the site	.2	___ Busy roads adjoin the site.
___ Land cover in the contributing watershed is predominantly "natural"	.2	___ Land cover in the contributing watershed largely contains impervious surface, bare ground, lawns, and row crops.
___ Land cover in surrounding buffer zones is predominantly a mix of natural grassland, native shrubland, woodland, wetlands, and water	.2	___ Land cover in surrounding buffer largely contains impervious surface, bare ground, lawns, and row crops.

Your Judgments:

Function Capacity score = _____, or circle one of the following:

1.0	.8	.6	(.4)	.2	0
Highest					Lowest

Now, summarize your function capacity assessments by recording them on the Assessment Summary Form (p. 59). Be sure to indicate that you used the Judgmental Method.